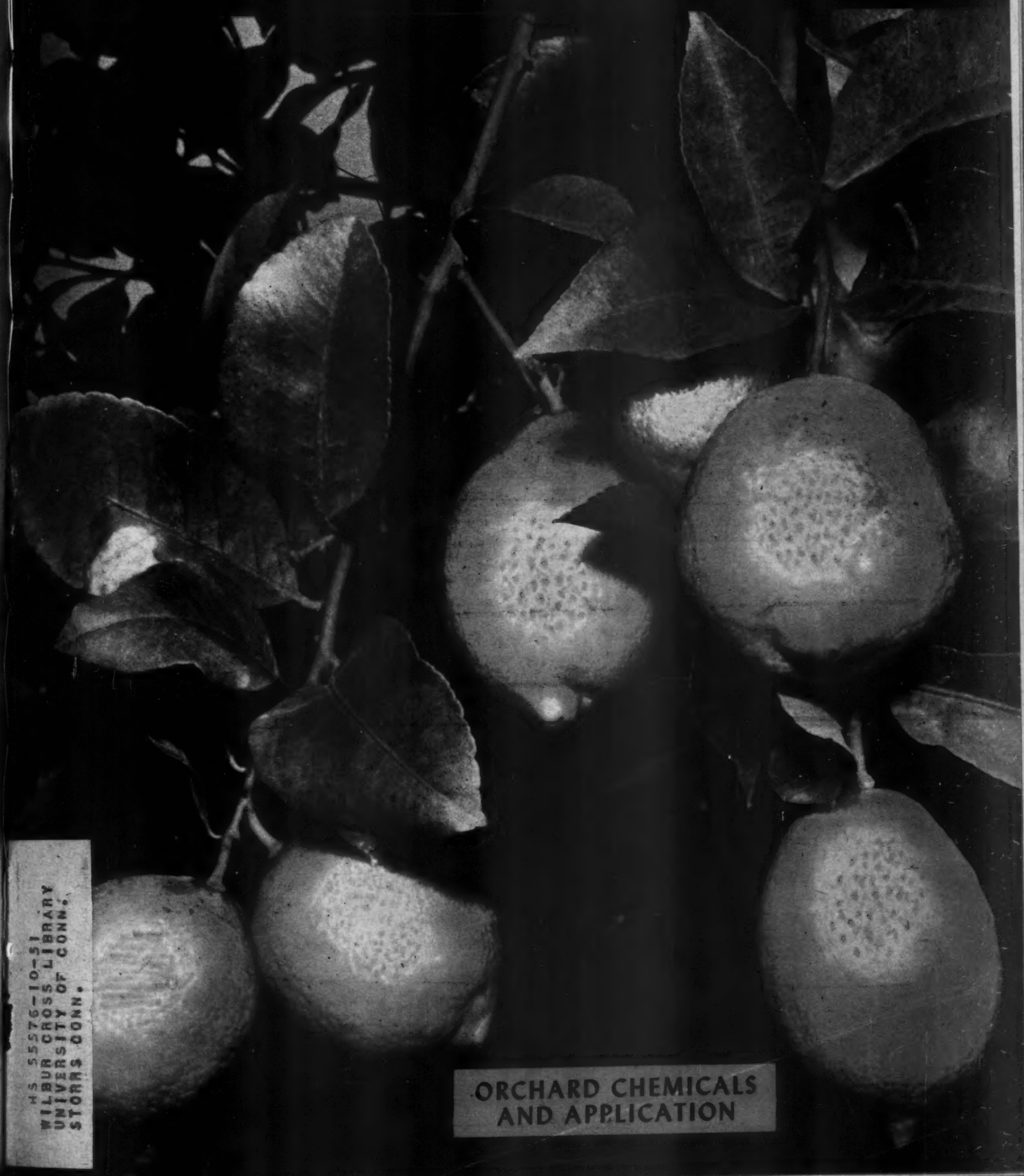
American FRUIT GROWER

FEBRUARY • 1948



ORCHARD CHEMICALS AND APPLICATION

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An intensive program of soil conservation, land reclamation and reforestation is in effect on Firestone Farms. Here, Champion Ground Grips are being used in a disc terracing operation.

The Birthplace of the FIRST Farm Tractor Tire is Today's Greatest Farm Tire Proving Ground-

Firestone FARMS

One corner of Firestone Farms where tractor tires are tested. All types of roads are used to determine wearing qualities.

EVER since the day Harvey S. Firestone tested and proved the first practical pneumatic tractor tire on his own tractor in his own fields, Firestone Farms have been the first and foremost proving grounds for farm tires.

The Firestone Champion Ground Grip is a product of all these years of experience and testing. It has been tested and proved against tires of every type, every tread design.

In every test, the Champion Ground Grip has proved its superiority . . . proved it by as much as 100% more effective cleaning, 62% more drawbar pull and 91% longer life.

Because the Firestone Champion Ground Grip has been tested and proved on Firestone Farms, it will do a better job for you on your farm.

When you buy a new tractor or replace the tires on your present tractor, get the tire that has been proved on the farm . . . the Firestone Champion Ground Grip.

Listen to the Voice of Firestone every Monday evening over NBC

Copyright, 1948, The Firestone Tire & Rubber Co

On Any Farm Job Firestone CHAMPION Ground Grips

OUTCLEAN, OUTPULL, OUTLAST ANY OTHER TRACTOR TIRE

Entered as second class matter at Post Office at Cleveland, Ohio, under the Act of March 3, 1879. Additional entry at Mount Morris, Ill.

Now You Get Greater Coverage at Lower Cost on All Spraying Jobs

NEW IRON AGE SPRAY HEAD
Gives You 2-Sprayers-in-1

PROFIT-MINDED orchard and grove operators know now more than ever why *it pays to spray the Iron Age way.*

For the amazing new Farquhar Iron Age automatic - oscillating Spray Head attachment makes all Iron Age Sprayers *universal* . . . actually gives the grower *two-sprayers-in-one.*

For Quick Once-Over

Use this Iron Age machine with spray head attachment for a quick high-speed drive-through job. Spray head operates up and down 50 times per minute, stroke is adjustable 45° to 90° of travel.

For Follow-Up Work

Detach the spray head and go to work on your crop with guns and brooms for careful follow-up required on many spraying jobs. Either way, you are ahead with Iron Age, because the famous *Iron Age Pump* delivers the constant high pressures needed for maximum coverage at lowest operating cost. It's built to stand the gaff under toughest operating conditions.

Before you buy *any sprayer,* find out how this amazing Iron Age *two-in-one machine* can give you more coverage, more speed, and cut your spraying costs lower than ever before. Find out now which Iron Age orchard or grove model can best fit your particular spraying requirements.

Ask your Iron Age Dealer for complete details, or send for FREE information to:

A. B. FARQUHAR COMPANY, *Farm Equipment Division*
3425 Duke Street, York, Pennsylvania

Farquhar
IRON AGE
YORK, PA.
POTATO AND VEGETABLE PLANTERS • TRANSPLANTERS
SPRAYERS • DUSTERS • POTATO DIGGERS • WEEDERS
CONVEYORS • JUICE PRESSES • SPECIAL MACHINERY
PLANT AND SPRAY THE IRON AGE WAY

Brand NEW for '48

New all through!

NEW ENGINES! Brand new Six, two power-packed new V-8's. Up to 145 horsepower!

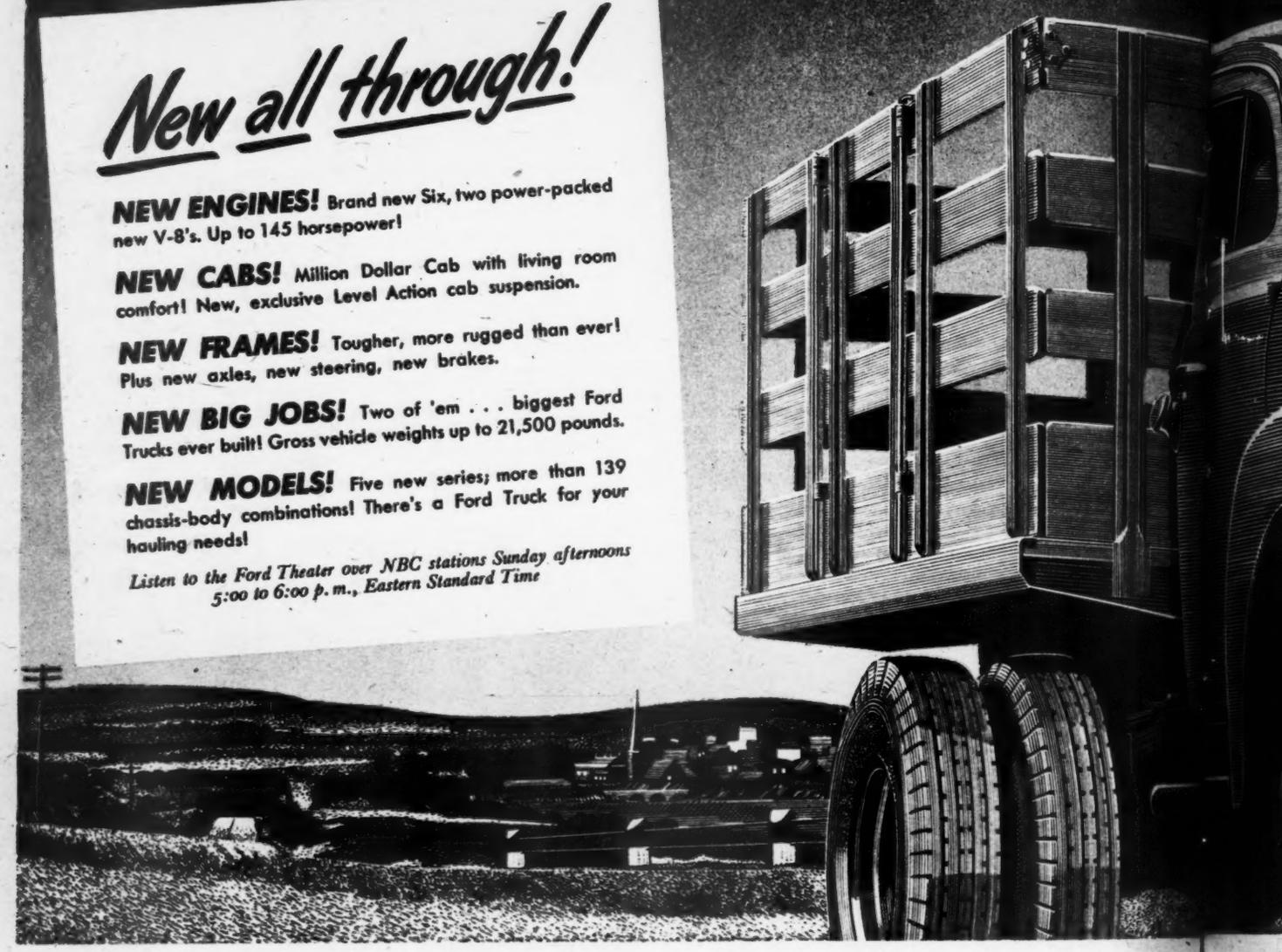
NEW CABS! Million Dollar Cab with living room comfort! New, exclusive Level Action cab suspension.

NEW FRAMES! Tougher, more rugged than ever! Plus new axles, new steering, new brakes.

NEW BIG JOBS! Two of 'em . . . biggest Ford Trucks ever built! Gross vehicle weights up to 21,500 pounds.

NEW MODELS! Five new series; more than 139 chassis-body combinations! There's a Ford Truck for your hauling needs!

Listen to the Ford Theater over NBC stations Sunday afternoons 5:00 to 6:00 p. m., Eastern Standard Time



Bonus* Built—AMAZING RESULT OF AN ENGINEERING PRINCIPLE

The great new Ford Trucks for '48 are revolutionary not only because they are *new all through*, but because they are the amazing result of a time-proved truck engineering principle. This principle is Ford Bonus Built construction!

Bonus Built=Extra Strength! Every single one of the great new Ford Trucks for '48 is designed and built with *extra strength* in every vital part—that's Bonus Built! But that is only *part* of this vital truck building principle . . .

Bonus Built=Work Reserves! This *extra strength* provides WORK RESERVES that pay off for truck operators in two important, money-saving ways . . .

Bonus Built=Greater Range of Use! These Bonus Built WORK RESERVES give Ford Trucks a *greater range of use* by permitting them to handle

'48 FORD Bonus* Built TRUCKS

BUILT STRONGER TO LAST LONGER

THAT ASSURES LONGER TRUCK LIFE . . . and ONLY Ford Trucks Have It!

loads beyond the normal call of duty! Ford Trucks are *not* limited to doing one single, specific job!

Bonus Built = Longer Life! What's more, these same WORK RESERVES allow Ford Trucks to relax on the job . . . to do their jobs easier, with less strain and less wear. Thus, Ford Bonus Built Trucks last *longer* because they work *easier!*

Here's the top truck value of the year . . . the trucks that are built stronger to last longer! See the great new line of Ford Bonus Built Trucks for '48 now! Don't settle for less—get the only truck that's Bonus Built! It's Ford!

***BONUS:** *"Something given in addition to what is usual or strictly due."—Webster's Dictionary*

LIFE INSURANCE EXPERTS PROVE . . . FORD TRUCKS LAST UP TO 19.6% LONGER!

ANNOUNCING

Thiophos 3422

TRADE MARK

PARATHION

THEV
THPRO

KILLMIT
ANMA

NEW

Here is the new insecticide that is more effective against a wider range of insects, mites and other lower invertebrates than any other chemical now in use. Developed by American Cyanamid Company, THIOPHOS 3422 was reported nationwide by the press in November 1947. This new compound fills the urgent need for a chemical to kill mites which multiply when DDT is used.

TESTED

THIOPHOS 3422 was tested in 1947 by approximately 165 entomologists at 75 Federal and State Experiment Stations on practically every major crop and economic insect. This probably constitutes the most intensive experimental program ever accorded any insecticide in so short a time.

EFFICIENT

Experiments in 1947 demonstrated beyond doubt the outstanding efficiency of THIOPHOS 3422 against mites and other fruit pests. The action of this new chemical against fruit pests is so effective upon application and so sufficiently long-lasting that almost unbelievably high kills are achieved. Yet the active ingredient is volatile and 14 to 21 days after the final application residues are practically non-existent.

COMPATIBLE

THIOPHOS 3422 mixes readily with other insecticides and fungicides to meet specific requirements. It is compatible with wettable and dusting sulfurs, insoluble coppers, DDT, benzene hexachloride, rotenone, pyrethrum and lead arsenate.

CROP

Apple
Apple
Apple
Apple
Apple
Apple
Apple &
Pear
Pear
Pear
Prune

30-X ROCKEFELLER PLAZA

THE NEW CHEMICAL THAT SOLVES THE PROBLEMS CREATED BY DDT

KILLS MITES, SPIDERS, WOOLLY APHIDS AND MANY OTHER FRUIT PESTS

ECONOMICAL

The remarkably low dosages which control mites and other fruit pests will make THIOPHOS 3422 as inexpensive to apply as any other insecticide.

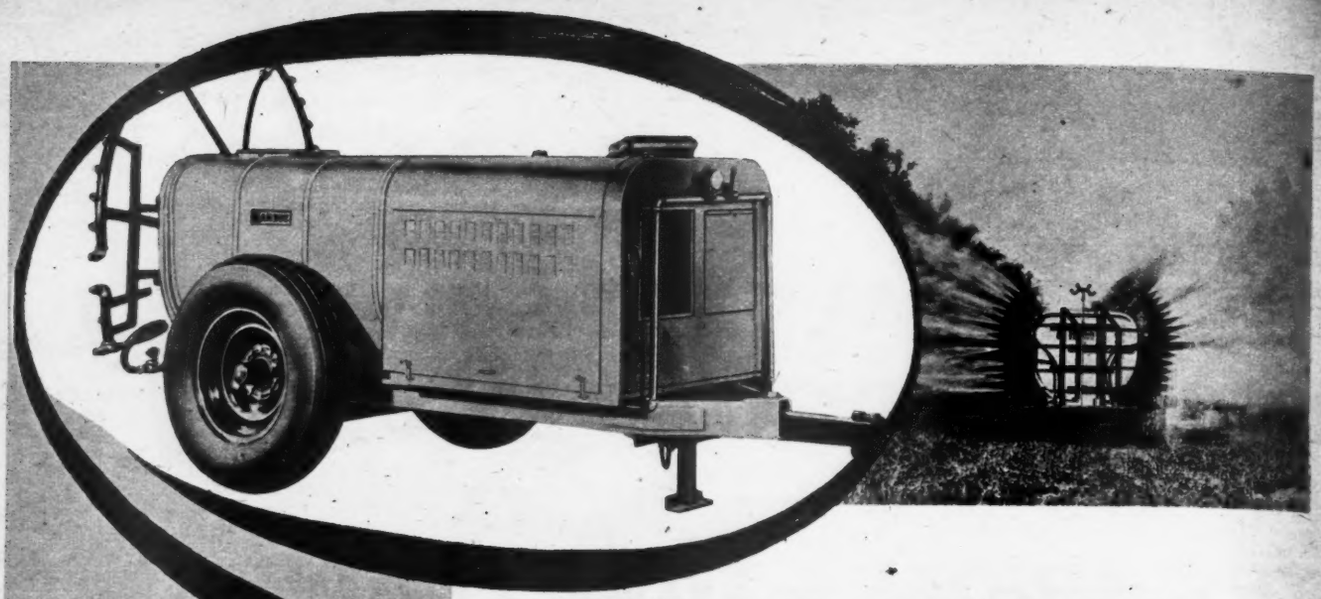
CROP	PEST	DOSAGE	NUMBER OF APPLICATIONS
Apple	European red mite	½ lb. 15% Wettable Powder per 100 gal.	2 to 3
Apple	Schoenii mite	½ lb. 15% Wettable Powder per 100 gal.	2 to 3
Apple	Two spotted mite	½ lb. 15% Wettable Powder per 100 gal.	2 to 3
Apple	Pacific mite	½ lb. 15% Wettable Powder per 100 gal.	2 to 3
Apple	Woolly apple aphid	1 lb. 15% Wettable Powder per 100 gal.	1
Apple	Red-banded leafroller	3 lb. 15% Wettable Powder per 100 gal.	2
Apple & Pear	Mealybug	1½ lb. 15% Wettable Powder per 100 gal.	1 to 2
Pear	Pear psylla	1 lb. 15% Wettable Powder per 100 gal.	1 to 2
Pear	Mites	½ to 1 lb. 15% Wettable Powder per 100 gal.	2
Prune	Bud moth	2 lb. 15% Wettable Powder per 100 gal.	As needed
	Grasshoppers	2 lb. 15% Wettable Powder per 100 gal. 150–200 gal./acre	1
	Grasshoppers	10–20 lb. 2% Dust per acre	1

Rates of application may vary with local conditions and agricultural authorities should be consulted for specific directions.

WETTABLE POWDER AND DILUTE DUSTS MANUFACTURED FROM THIOPHOS 3422 PARATHION WILL BE SUPPLIED THIS SEASON UNDER DIFFERENT TRADE NAMES BY WELL-KNOWN MANUFACTURERS

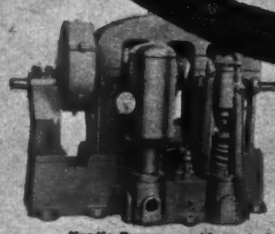
Thiophos TRADE MARK **3422**
PARATHION

NEW YORK 20, NEW YORK

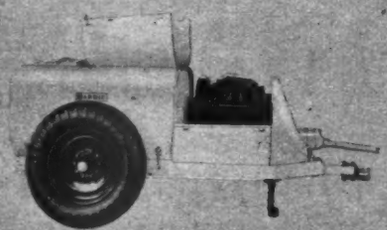


MASS SPRAY APPLICATION WITH

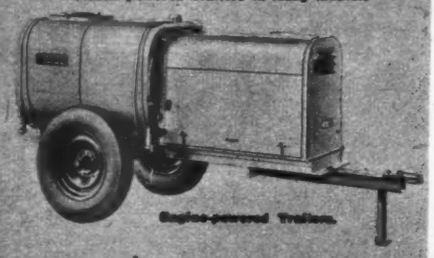
Complete Pest Control



Hardie Pumps are big and strong.

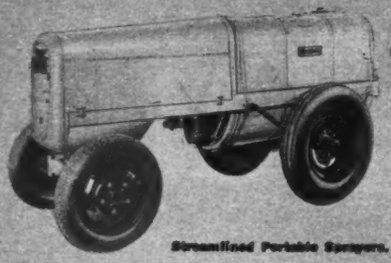


Tractor-powered Trailers in many models.



Engine-powered Trailers.

Wheel Spray Booms for all sizes.



Streamlined Portable Sprayers.

The Hardie Multi-Nozzle Orchard Spray Boom sprays one or both sides of the row as desired while the sprayer is in motion. Volume and direction of spray are controlled from the driver's seat. Can be attached to any high pressure sprayer of adequate capacity. Gives complete pest control under any and all conditions with ample volume, penetration and coverage. Readily removed when hand gun application is desired. Find out about this and other new things in the 1948 Hardie Line. Write for the new catalog.

THE HARDIE MFG. COMPANY

Hudson, Mich. Los Angeles 11, Calif. Portland 9, Oregon
Export Dept. Detroit 26
Canadian Office: Clarence W. Lewis & Son Ltd., Grimsby, Ont.

Hardie
Dependable Sprayers

PERFECT AGITATION · COMPLETE LUBRICATION

FOR *BIGGER* AND
BETTER CROPS...

the PENCO PROGRAM

This year, you can look for better crops than ever . . . through better insect control with a straight *Penco* Program. To help you in the proper application of *Penco* products, Pennsalt maintains a staff of technical representatives in your area. Consult the one nearest you for any advice you need.

For Worm control:

PENCO* WB-50 *with 50% DDT*

Superior DDT Spray for codling moth control. Made *in* the Northwest *for* the Northwest by Pennsalt—a leading basic producer of DDT, backed by 15 years' experience in the Northwest.

- Tested and proved in *your* area to meet *your* needs.
- Micron-sized for better suspension and deposit.
- Contains superior spreaders and stickers.

KRYOCIDE* *Natural* **Cryolite**

For over 16 years, Kryocide has been a leading codling moth insecticide. It will not sterilize soil, upset natural insect balance, nor harm tender foliage or fruit. It is not acutely toxic to man or animals. When in doubt—use Kryocide!

For Aphid control:

PENCO* BHC *(Benzene Hexachloride)*

Penco BHC & Wettable Base W-12 has unusually high Gamma Isomer content of 12%. It's a valuable new addition to your spraying program . . . especially for control (up to fruit formation) of apple aphids (green, rosy, woolly). Conforms to Pennsalt's rigid standards of quality and uniformity.

For Spider Mite control:

PENPHOS (PARATHION)

Now in the experimental stage is Pennsalt's newest organic phosphate insecticide—*Penphos*. Tests at our Whitemarsh Research Laboratories indicate that it holds great promise for control of various Mites, Spiders and Aphids. As soon as available, *Penphos* will be offered to Northwest growers.

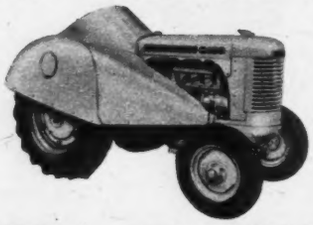
*Reg. U. S. Pat. Off.

PENN SALT

AGRICULTURAL CHEMICALS

● The popular-priced grove Model "VAO" is rated as a light 2-plow tractor.

The More Tractors You Look At



● Model "SO" is rated as a full 2-plow tractor for faster, heavier work.

. . . The More You'll Like a CASE

● Model "DO" is rated at 3-plow capacity, for fast work with larger implements.

Tops for Thrifty Grove Care

● You gain in two ways when you do your work with a Case Grove Tractor. It has the eager engine power, the right gear speeds, and the sure-footed traction to get full capacity from your implements. Its full-swinging, self-locking drawbar and fast steering save time at every turn. Its easy handling and quick fueling save time and strength, too. It all counts up to more work done well, means greater *yield per man.*

Then there's Case ENDURANCE. It means continued fuel economy, low upkeep, extra years of use from your investment. It's why men with much tractor experience have such high respect for Case tractors. For both these gains . . . more results per man-hour and lower power cost per acre . . . see your Case dealer. J. I. Case Co., Dept. B-13, Racine, Wis.

CASE

FEBRUARY 1948

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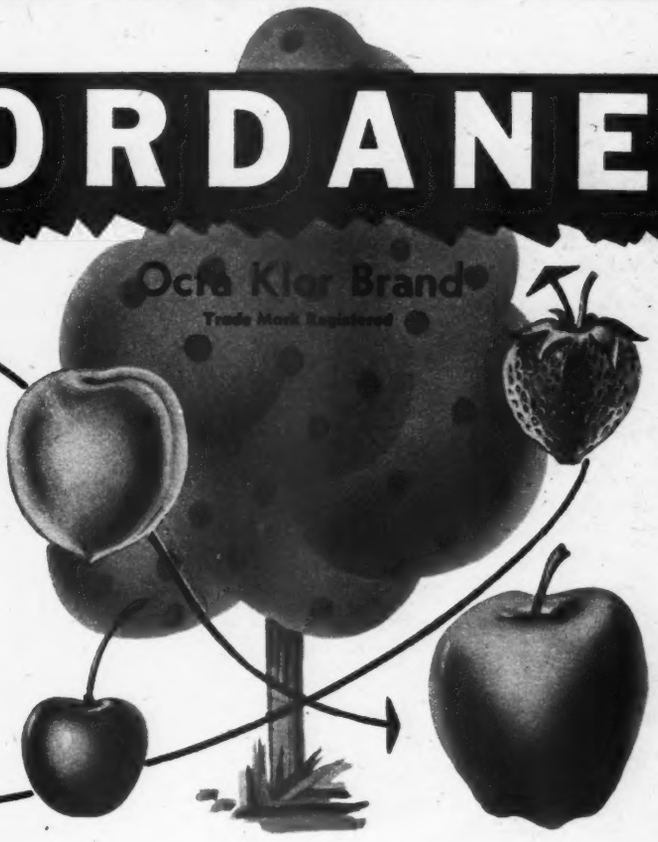
CHLORDANE

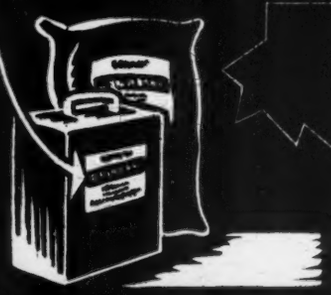


GIVES QUICK CONTROL OF

Plum Curculio, Cat-Facing Insects, Grasshoppers, Ants, June Beetles, Strawberry Weevil, Fruit Flies, Tree Crickets and Many Other Fruit Pests.

Your insecticide supplier should be able to furnish you Chlordane insecticides in the form you desire — dusts, wettable powders or emulsion concentrates. When you buy, be sure the label states "contains Chlordane" . . . There are no substitutes.

Write for Technical Supplement No. 208, "Direct Control of Plum Curculio and Other Fruit Pests". We shall be glad to give you further information concerning formulation and application of Chlordane insecticides for your fruit and other pest control problems.



In addition to prompt control of insect pests, consider these seven other basic advantages.

Chlordane-based insecticides:

1. **Do not impart flavor.**
2. **Greater effectiveness reduces number of applications necessary.**
3. **Give effective curculio control on peaches, reducing chance of brown rot infection.**
4. **Are non-repellent—kill instead of scattering insects.**
5. **Are sufficiently volatile to minimize residue hazard on treated fruit.**
6. **Are compatible with fungicides and many other insecticides.**
7. **Are more pleasant to use.**

CONSULT LOCAL AUTHORITIES FOR DETAILED INFORMATION ON USE OF CHLORDANE IN YOUR LOCALITY

Julius **HYMAN** *& Company*
DENVER, COLORADO

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PACIFIC COAST SALES OFFICE
9 MAIN STREET
SAN FRANCISCO 5, CALIF.

When you want D

THAT MEANS I'S

● DDTOL is the name used by The Sh... Williams Co. to designate its complete l... DDT formulations. Pure DDT is a white ... solid, of little value as an insecticide. It m... specially processed to make it effective fo...

HERE'S THE RIGHT DDT FOR ...

Product	Available
DDTOL 25% EMULSIFIABLE A 25% solution of DDT in xylene readily mixable with water.	30 and 55 ... gallon cans
DDTOL 50% WETTABLE Finely ground wettable powder for use as a spray.	...4 and 50 ... 1 pound
DDTOL 50% DUST A 50% DDT concentrate for use in preparing finished dusts.	... pound bag
DDTOL VINE-SAFE 50% WETTABLE A wettable powder containing refined DDT.	...nd 50 pou...
DDTOL 3% and DDTOL 5% DUSTS Ready to use DDT dusts.	... pound bag
DDTOL 30% SOLUTION A 30% DDT solution in xylene not mixable with water.	...nd 55 gall...

"It's DDTOL in that spray – we should have a good year!"

SHERWIN-WILLIAMS AGRI... LT...

DDT—say DDTOL

...S IT'S SHERWIN-WILLIAMS!

control. The DDTOL line is a group of special formulations of DDT, each designed for use in a different manner or for a different purpose. Whatever or wherever the need for DDT, there is a DDTOL formulation to do the job; a DDTOL to give better insect control at lower cost. This DDTOL line represents the results of extensive field and laboratory testing by the technical staff of the world's largest manufacturers of insecticides, fungicides and weed killers.

...T DDT FOR EVERY DUSTING OR SPRAYING JOB

Available in	For use on	Apply by
...30 and 55 gallon drums. ...gallon cans.	Potatoes, corn, alfalfa and clovers. Residual spray for livestock and stored grain pests.	Conventional or concentrated spray equipment or by airplane.
...4 and 50 pound bags ...d 1 pound cartons.	Many fruits, vegetable and shade trees; on livestock and buildings. A general purpose material.	Hand or power sprayers.
...pound bags.	Many field and truck crops.	Hand or power dusters.
...nd 50 pound bags.	Cucumbers, melons, squash and other cucurbits.	Sprayers or dusters.
...pound bags.	General field and truck crops; except cucurbits.	Hand or power dusters.
...nd 55 gallon drums.	Area treatment for mosquitoes and forest insects. Household spray formulation.	Airplane or fog machines.

SHERWIN-WILLIAMS
Insecticides, Fungicides and Weed-killers

COVER THE CROPS THAT COVER THE EARTH!

Out of one of the world's greatest research laboratories, manned by skilled technicians, came the line of paints that has made the name Sherwin-Williams famous for quality everywhere. Years of production and application experience have gone into the maintenance of that quality.

The production of a line of agricultural chemicals worthy to bear the Sherwin-Williams label required equally painstaking laboratory research and exhaustive field testing. You can look to Sherwin-Williams Agricultural Chemicals to protect your crops—just as surely as you count on Sherwin-Williams Paints to protect your property!

Ask your dealer for leaflets giving specific crop recommendations . . . or write direct to The Sherwin-Williams Co., Agricultural Chemicals Division, Cleveland 1, Ohio. (Export Division, Newark, N. J.)

PRODUCTS OF SHERWIN-WILLIAMS RESEARCH

...GRICULTURAL CHEMICALS

Plan NOW for dormant spraying

With SHERWIN-WILLIAMS INSECTICIDES and FUNGICIDES

PRODUCTS OF SHERWIN-WILLIAMS RESEARCH

FOR EFFECTIVE CONTROL OF:

APHIDS...EUROPEAN RED MITE...SAN JOSE SCALE

DINITRO-SOL (water soluble)—20% sodium salt of dinitro-ortho-cresol for aphid eggs—when European red mite and San Jose scale are not a problem. Use as a ground spray to destroy over-wintering scab on apple leaves.

DINITROL—40% dinitro-ortho-cresol powder for use with a good dormant oil against European red mite and San Jose scale, as well as aphids.

FREE-MULSION—a white, flowable, non-caustic, petroleum oil emulsion for dormant sprays.

SPRA-MULSION—an easily-mixed, petroleum oil emulsion for dormant sprays.

These dormant spray materials—products of Sherwin-Williams research—give highly effective control of both insects—in the egg as well as in the adult stage—and of tree diseases. Ask your dealer for the Sherwin-Williams Spraying Guide—or write direct to The Sherwin-Williams Co., Agricultural Chemicals Division, Cleveland 1, Ohio. (Export Division, Newark, N. J.)

AGRICULTURAL CHEMICALS

Ford TRACTOR

HARD WORK *becomes* EASY WORK

That is why the Ford Tractor helps you get more done

Right on *your* farm the Ford Tractor and Dearborn Implements will make hard jobs easier.

For example, discing becomes an easier job and you get better results.

Dearborn Disc Harrows are controlled by the exclusive built-in Ford Hydraulic system through the touch control lever. With it you raise or lower the Dearborn Lift Type Discs. Or, with Dearborn Pull Type Discs, you use it to angle and straighten the gangs.

Thus, with any Dearborn Disc, there are no mounds of dirt left at the end of the field, no damage to grassed waterways, no "trouble" in wet spots. And because you relieve the load when turning, you save fuel.

Ask your Ford Tractor dealer to demonstrate a Dearborn Disc on your farm. And see what this Ford Tractor can do for you in many other ways.

DEARBORN MOTORS CORPORATION, DETROIT 3, MICHIGAN

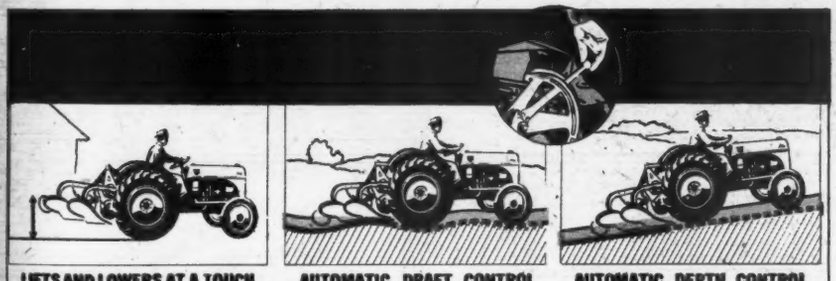
The only time that Counts is Working Time

CHOOSE THE DEARBORN DISC THAT FITS YOUR NEEDS

This Dearborn Lift Type Single Disc, left, is raised to transport position . . . or lowered to working position . . . with Ford Hydraulic Touch Control.

With both model Dearborn Tandem Discs, right and below, you set the working angle of the disc gangs . . . or straighten them . . . with Ford Hydraulic Touch Control.

There is a Dearborn Disc Harrow to fit your farm. Whatever type you choose will be well designed and strongly built and it will do more discing faster, easier, better.



LIFTS AND LOWERS AT A TOUCH
Lifting and lowering of implements is done anywhere, any time by merely touching the hydraulic control lever. No straining, no tugging.

AUTOMATIC DRAFT CONTROL
Under uniform soil conditions the selected working depth will be automatically maintained even in fields with an irregular surface.

AUTOMATIC DEPTH CONTROL
Under reasonably smooth surface conditions just set the controls once and uniform working depth is automatically maintained.

See Your Dealer. Your nearby Ford Tractor dealer is headquarters for Ford Tractors, Dearborn Implements, genuine Ford Tractor parts and for implement and tractor service second to none.

Dearborn FARM EQUIPMENT

The Ford Tractor and a quality line of Dearborn Farm Equipment are built to work together, for better, faster farming.

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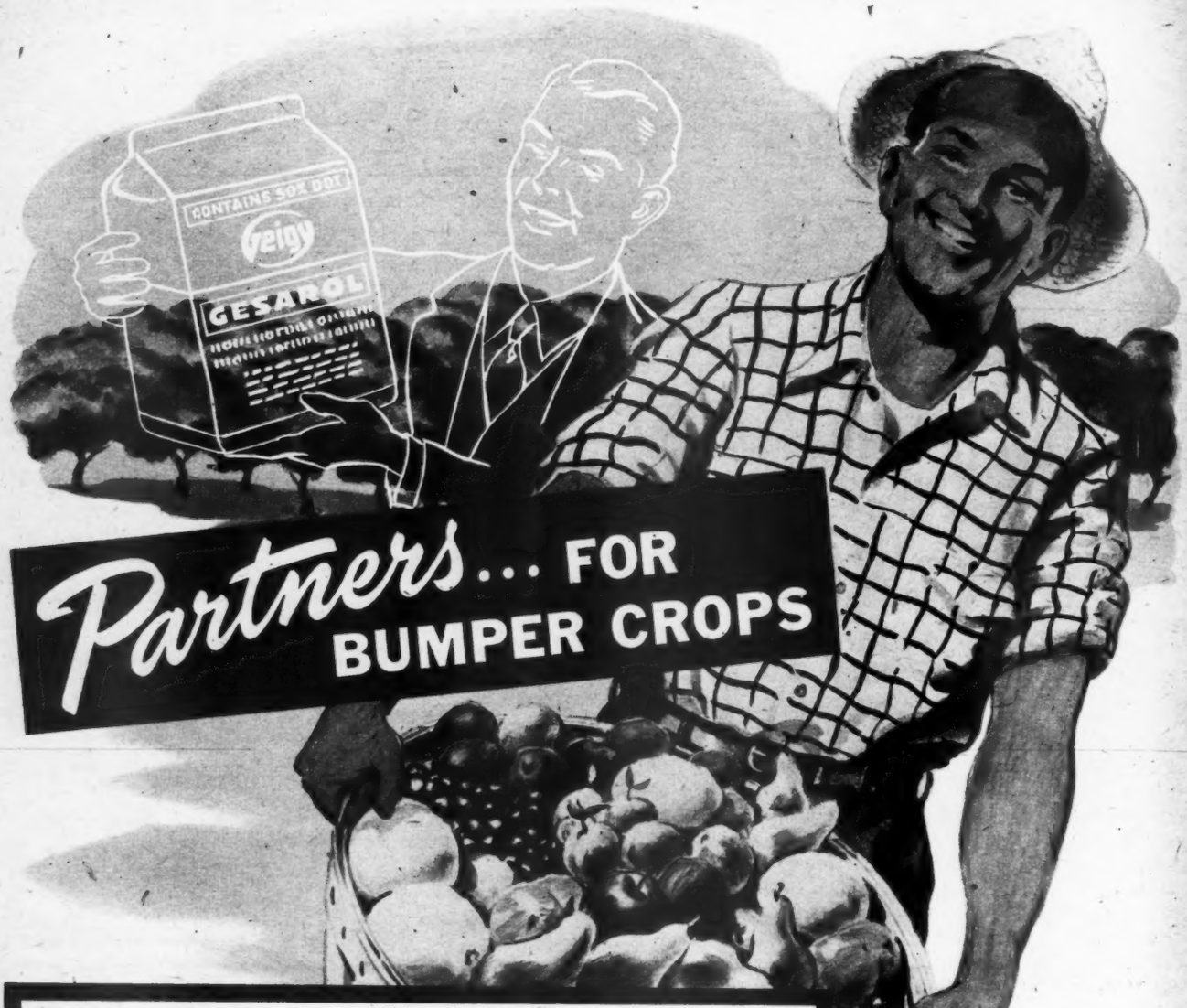
Ford Farming MEANS LESS WORK . . . MORE INCOME PER ACRE



Partners... FOR BUMPER CROPS

GOOD MANAGEMENT *and*...

GESAROL AK 50

The perfect team for greater PROFITS

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ORIGINATORS OF DDT INSECTICIDES

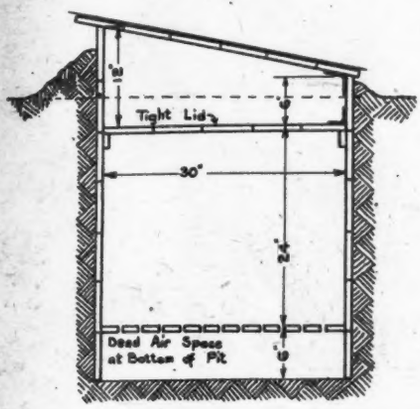
LETTERS TO THE EDITOR

A Scion Storage

Dear Sir:

Enclosed is a sketch of a scion storage that has proven practical here in Iowa for a number of years. Such a pit holds bud sticks in good condition for a few days longer than any other type of place I have tried except the refrigerator.

Scions may be cut at any time they are in good condition to cut, then the cut ends dipped in grafting wax, tied in bunches and dropped in the storage pit. They then may be taken out as needed. The wood will keep in good grafting condition until early summer.



My pit is 30 inches wide and 42 inches long. The size may be varied to fit individual needs. It is very important that the box be well fitted together to be rodent proof. The floor of the box should not be too tight. I use narrow strips for the floor, spaced about one-quarter inch apart.

The soil should be mounded about the box to provide for the drainage of water away from the box. The box should be covered with some sort of mulching to a depth of about a couple of feet. This will maintain a temperature in which scions will remain in good growing condition.

This idea may help the correspondent whose inquiry appeared in the December issue.

Marshalltown, Iowa — Wheelock Wilson

Mounding for Mice

Dear Sir:

In the November issue of the AMERICAN FRUIT GROWER there is a very interesting article on meadow mice. We have experienced much loss from mice in the past, and have, so far, depended on poisoned grains to hold them in check.

Last year we tried something new. We placed dirt around the base of the trees to about eight inches high on the trunk and with as narrow base as possible. We waited until steady freezing weather had set in before placing the dirt around the trunks. We found that rather than scrape the dirt from the bases of the trees, we saved labor by hauling sand from a nearby sand pit. Within a few hours the mounds were frozen stiff, like cones around the trees, and remained in that condition until thawing weather in the spring leveled them. The theory was that the mice tunneling under the snow would not climb the clean sand to get to the tree trunks which, in many cases, were above the snow line. Mice do not like to expose themselves above the snow line. We found less damage to the trees where mounding was done than where the poison bait was used. Mouse conditions were ideal in both experiments.

Our conclusion is that mounding is a better mouse damage control than use of poison bait and that labor and other costs would not be half as much as using poisoned grain in cans or placing poisoned apple cubes in the runways or tunnels. A tree can be mounded with sand from a trailer in much less time than it would take to locate a run in which to put the poisoned bait.

Riverdale, Mich. — Martin Joiner

A Pruning Stub

Gentlemen:

On page 20 of your December issue, you illustrate the proper way to make pruning cuts. Illustration number 6 is not correct. By so doing, you will leave a stub as is shown in number 6, immediately above the shear. This stub will catch hands or clothing, will not heal over properly, and another water sprout may start from it.

The proper position for the shears is, as you say, with the blade on the underside of the branch, but also *against* the limb from which the branch is to be cut, with the hook of the shears outside and not against the limb as shown in the illustration. This means just reversing the position of the hand.

Steilacoom, Wash. — C. G. McDonald

Expert pruner McDonald has keen eyes. Herewith we reverse the position of our pruning shears.—Ed.

November Cover

Gentlemen:

Will you please tell me the name of the crab apple variety pictured on the cover of the November issue of AMERICAN FRUIT GROWER?

Des Moines, Iowa — A. F. den Boer

It is the Hyslop crab apple, a standard and popular variety in this country since 1869.—Ed.

Cassberry Identified!

Dear Sir:

I just received a berry plant catalogue published in Los Angeles, and I find the following therein: "Cuthbert Red Raspberry. This berry has often been called Cassberry here." This will answer your reader's question.

San Leandro, Calif. — C. Rose

To reader Rose our compliments for solving a question that had us all stumped. —Ed.

An Answer to the Bird Problem?

Dear Sir:

In your October, 1947 issue, under "Nationwide Fruits," you discuss supersonics and the possibility of killing germs and bacteria in the orchard with inaudible sound waves. It would seem that another possible use for supersonics would be the control of birds.

If certain supersonic waves can make men ill and dogs whimper (and I understand that there is probably an effective sound wave length for every creature), then it would seem a possibility to control birds in the orchard with the supersonic waves by making the area unpleasant or unhealthy for them. This would surely be of great interest to cherry growers.

Canandaigua, N.Y. — Richard G. Rouse

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THE TRAVERSE SUPER BOOM
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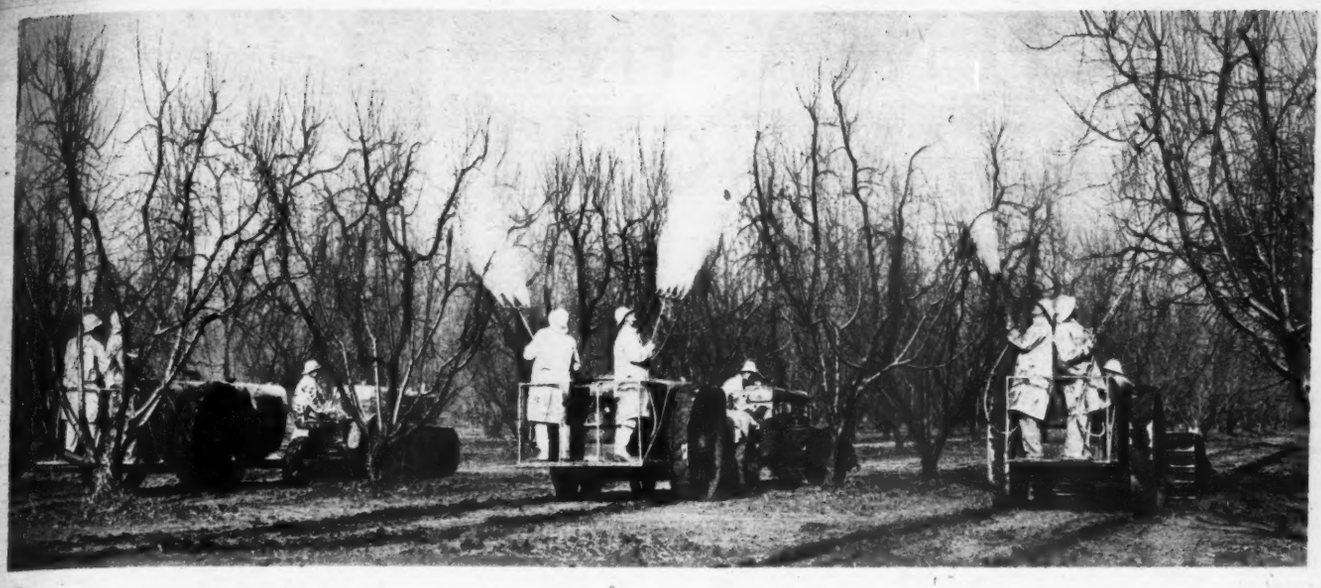


PARATHION AND CHLORDANE JOIN DDT IN INSECT BATTLE

By B. A. PORTER, *United States Department of Agriculture*

BEWILDERING IS still the word that best describes the present orchard insecticide situation. The introduction of DDT was just the start of a steady flow of new products. This flow now threatens to become a flood. Entomologists are hardly started on a study of a new material when pressure comes for recommendations, and soon a still newer material may press for attention and recognition. Some of the more important developments of the season of 1947 will be discussed in this article. It is expected, however, that with another season's work, or perhaps even before this article is in print, some of the statements will need revision. Such is the present pace.

DDT is now virtually a standard material in orchard areas where the codling moth has been hard to control. Aided by weather unfavorable to the worms, DDT has cut worm infestation in many orchard sections to the lowest point in years. Optimists even toy with the idea of leaving out all codling moth sprays some seasons. Such a dream may sometime come true, but the codling moth still has great powers of multiplication. At any time there may be a swing from the unfavorable weather conditions of the past few years to favorable conditions that will make worm control much harder.

DDT continues to stimulate mite abundance in many orchards, although there are many puzzling exceptions. The killing off of natural enemies is an important factor, but the whole story of what happens when DDT is used in an orchard remains to be unfolded. The problem of mite control is receiving much of the attention of investigators that was formerly directed to the problem of worm control, and real progress is being made. Certain of the materials discussed later in this article may fill this need.

The red-banded leafroller has suddenly become a major pest in numerous additional places following the use of DDT, especially in western New York. DDT doesn't seem to poison this leafroller as readily as it does the codling moth, and is probably killing off some of the leafroller's enemies. The solution of this problem seems to be to put lead arsenate back into part of the spray schedule.

Against other orchard insects DDT is performing much as forecast in earlier articles. It is unexcelled for control of most kinds of leafhoppers and is fast coming into use for grape berry moth control. Results on oriental fruit moth are conflicting, and it is evident that a careful adjustment of spray schedules to the seasonal development of the insect in each locality will be necessary. Results in peach tree borer control have likewise varied, but reasonably good results have, in many cases, followed the use of several applications—to the trunks and lower branches of the trees—of DDT at 3 to 4 pounds per 100 gallons, several times as strong as needed for codling moth. DDT also looks good as a control for shot-hole borers.

Because of its musty odor, which sometimes affects the product on which it is used, benzene hexachloride is making slow headway. It may, however, find a place in the control of the plum curculio on peach. In several series of experiments it has appeared to be about equal to lead arsenate in curculio control. However, lead arsenate isn't too good for this purpose and something much better is urgently needed. The use of more applications and higher strengths of benzene hexachloride may improve results somewhat, but the danger of hurting the flavor of the peaches will limit its use as harvesttime approaches. Benzene hexachloride also has some value against the pear psylla and the woolly apple aphid, but the possible effect on the flavor of the fruit may prevent its use.

Chlordane may fit into a few special uses in fruit insect control. Preliminary tests have indicated that it may be good for curculio control. It is very poisonous to many kinds of grasshoppers and could possibly be adapted for grasshopper control in orchards when necessary. Chlordane is very effective against the grubs of the Japanese beetle in the soil, and may also have value against other soil insects. Its effect on plants, however, has not yet been determined.

Chlorinated camphene is another product that may find a few special uses in orchard insect control. Right

(*Continued on page 44*)

EFFICIENCY IN SPRAYING

Ways To Apply More Gallons A Day
How To Obtain More Value Per Spray Dollar
How To Make Spraying Easier

By T. E. LAMONT

TODAY NEARLY ONE-HALF of the cost of growing apples, up to picking time, is for spraying and dusting. Here, surely, is a good place to start cutting costs, and cost cutting will certainly be necessary in the years ahead. The last year fruit prices have been lower than a year earlier and costs higher. The long-time outlook is for a still narrower margin between prices and costs. A major break in apple prices is not likely to occur in 1948, but sooner or later it is coming. The best suggestion for 1948 is to farm aggressively, but conservatively, and watch one's costs.

A study by Kenneth Robinson in New York in 1946 showed the cost of spray and dust material was 57 percent of the total cost of spraying and dusting. The other 43 percent was for labor and machinery to apply the materials. Here is a challenge to entomologists and plant pathologists to speed their efforts to find cheaper and more effective materials and to determine the minimum amount that will do the job.

Mr. Robinson held a watch on 56 New York growers while they were spraying, to determine how long it took to do each spray operation and the total time to spray out a tank. For those using the high pressure rigs, the least efficient were applying about one tank an hour, while the more efficient were applying two tanks an hour. The low one-third in efficiency applied 520 gallons per hour as compared with 920 gallons for the high one-third. Those using Speed Sprayers applied 1811 gallons per hour, or about double what the more efficient growers with high pressure rigs were doing. Most of those using Speed Sprayers also used filler trucks. There were nine records on Speed Sprayers, and probably they were made by the ones who could make the most efficient use of Speed Sprayers.

Spray Efficiency Figures

Hi-pressure rigs	*Mins. per tank*	*Gals. per min. sprayed*	*Avg. size tank*	*Max. gals. per hour*
Low ⅓	49	17	427	520
High ⅓	31	27	475	920
Speed Sprayers	18	65	500	1811

Mins. per Each Operation per Tank

Hi-pressure rigs	*Refill*	*Travel*	*Total non spray**	*Actual spray*
Low ⅓	8	10	21	28
High ⅓	6	5	12	19
Speed Sprayers	5	4	10	8

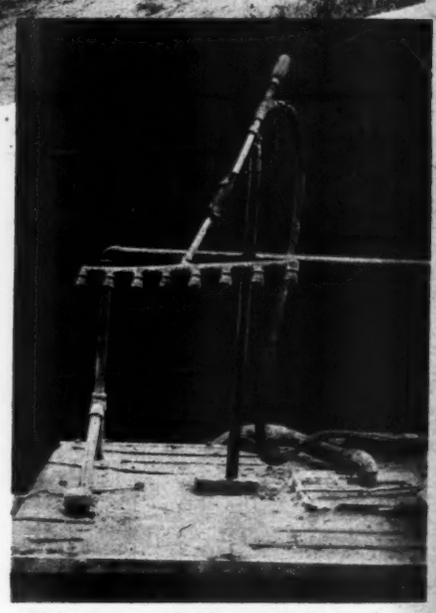
*Also includes turning and shutting off gun between trees.

Good roads let vehicles move easily in orchards in all kinds of weather.

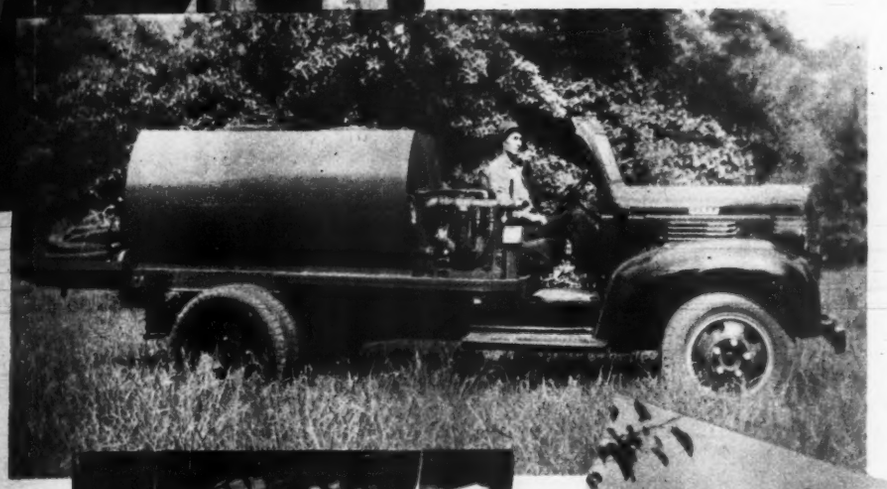
The growers who applied about one tank an hour took longer to refill, to travel back and forth, and to spray out a tank than those in the two-tank-an-hour group. The low one-third took eight minutes to refill as compared with six minutes for the high one-third. The time to travel back and forth to refill was 10 minutes as compared with five, and the actual time spraying was 28 minutes as compared with 19. For a round trip this meant 49 minutes for the low one-third as compared with 31 for the high one-third.

Before harvest, Robinson and Professor James Dewey of the Cornell Department of Entomology visited most of the orchards and made a sample check of the control obtained. They found that the growers who applied the most tanks a day had the best control of apple scab and codling moth. More rapid spraying makes possible more timely applications.

Robinson's study indicates that a grower with a high pressure rig should apply about two tanks an hour. It should take about 20 minutes to spray



This spray gun holder, made by George LaMont, takes work out of spraying.



Left—Large storage tank outlet saves grower many precious minutes.

Below—Sprayer supply unit saves time.

Big tires help, too.

Arranged for convenient efficiency is this supply unit with overhead tank, platform, and storage house.

The best assurance that your pump will deliver the maximum amount of material per minute is to overhaul it this winter so that it will be ready to go in spring.

2. Maintain high pressure (500 pounds or more)—High pressure gives a finer spray, better coverage and more coverage with a tank full of spray. To reach and cover the tops of trees, high pressure, together with the proper size discs which are not worn, is essential.

3. Have convenient water supply—The supply of water should not be out a tank, five minutes to travel back and forth, and five minutes to refill. In case you are not hitting these standards, the following suggestions are offered:

1. Use pump to capacity—Have enough nozzles and large enough discs to use the pump to its maximum capacity. There should be just a trickle coming in the overflow when the guns are open. The dosage per tree can be regulated by the speed of the sprayer.

Some growers have pumps which are too small. Where one has more than 25 acres to spray, a 35-gallon-per-minute pump and a 500-gallon tank are the minimum size required. more than one-eighth or one-quarter of a mile from any orchard block. More overhead tanks may be needed. Often overhead tanks can be connected, and if at different elevations, the supply can be controlled by float valves. More water holes may be the best solution in those areas where the subsoil holds water. Water holes can usually be dug for 50 to 75 dollars, and there is little or no depreciation on them. When near buildings, water holes also aid in fighting fires.

It is often muddy around water holes, and there is danger of sucking up mud with rapid filling. The writer has overcome these two difficulties by putting in 10 to 15 feet of tile from the bottom of the pool to the filling place. Here three or four wooden barrels have been set on top of one another over the end of the tile. This job is done as the pool is being dug. The suction hose can be dropped into the barrel and be free of mud.

4. On large farms, consider a supply truck—A tank truck is not a substitute for a convenient water supply. Water can be piped more cheaply than one can carry it; however, many water holes work in well with the use of a supply truck. The writer has sprayed 125 acres from three overhead tanks and a water hole. Since acquiring a Speed Sprayer and making a supply truck, he is digging four more water holes, so there will be less travel for the filler truck.

5. Have 2½- to 3-inch outlet from overhead tank—A 2½-inch outlet will discharge about 100 gallons per minute.

6. Have spray platform at filling place—The most desirable platform is one at the same height as the sprayer. The cheapest and quickest platform is built by placing some planks over four barrels.

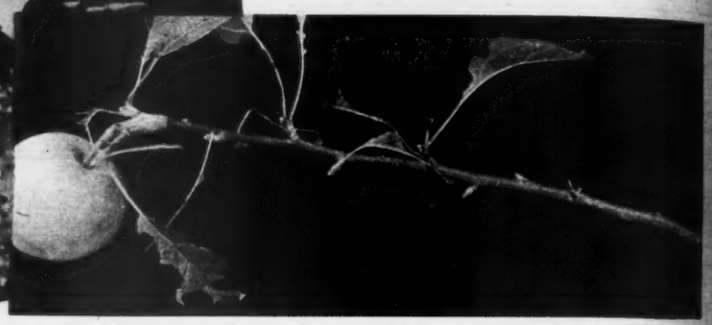
7. Have a shed at filling station for storing spray materials.

8. Have deep screen in tank in which to put spray materials—This should be at least 12 inches deep and have screen on all sides as well as the bottom, and should be large enough so that the water can go in at full speed while material is being washed through. Some growers like to measure and mix sulfur paste with water in an old grease drum and empty into the tank without its going through a

(*Continued on page* 58)

Left—Applying chlordane in orchard.

Below—Mr. Grasshopper has been here!



Photos courtesy of Dow Chemical Co.

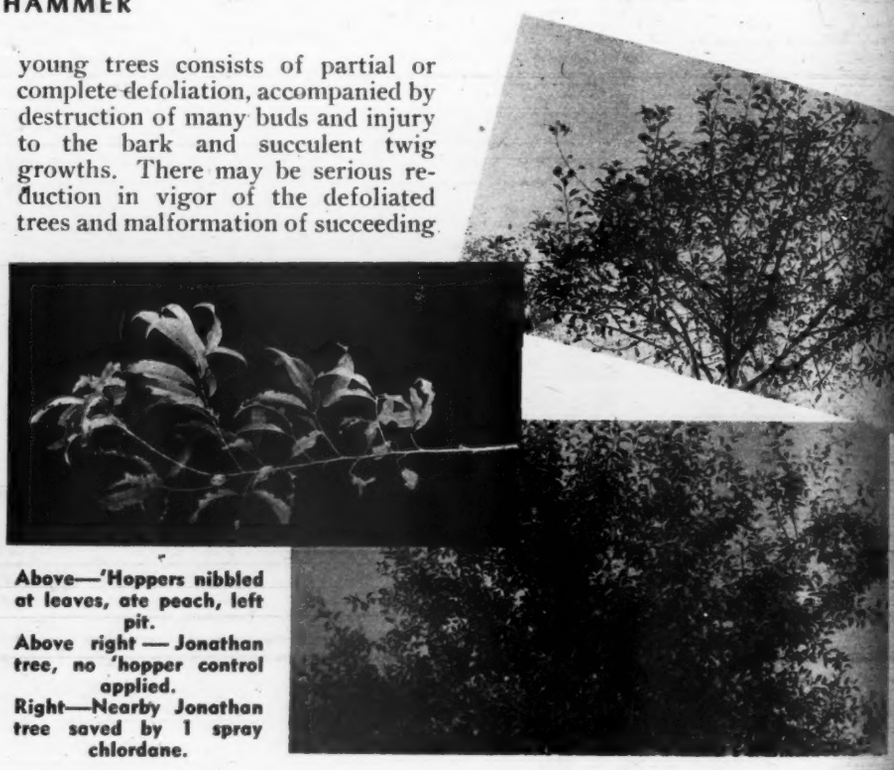
NOW GRASSHOPPERS JUMP ON FRUIT GROWERS

By O. H. HAMMER

THE VERY destructive populations of grasshoppers in the midwest during 1946 and 1947 served to give impetus to a search for new and better materials to control these pests. Fruit growers in Illinois, Indiana, Michigan and Ohio sustained particularly heavy damage. Extensive injury also was caused to strawberries, brambles and many vegetable crops. Some entomologists have declared the 1947 outbreak of this pest the worst encountered during the past 10 to 15 years.

Dry, hot weather during egg hatching and during the nymphal or wingless stage of hopper growth undoubtedly contributed largely to the destructiveness of the hoppers. It is well-known that fungus disease organisms which flourish in wet soils are very effective in killing eggs and newly hatched nymphs, and also that cool rainy periods cause the death of untold numbers of young nymphs. Such natural checks were not generally encountered in the midwest in 1947.

In the orchard most kinds of fruit trees are attacked by grasshoppers. The peach fruit is probably preferred, but severe damage has also occurred to apples. Young plantings of fruit trees are more severely injured than are mature ones. However, the latter sometimes are severely damaged. The principal injury to young trees consists of partial or complete defoliation, accompanied by destruction of many buds and injury to the bark and succulent twig growths. There may be serious reduction in vigor of the defoliated trees and malformation of succeeding growth.



Above—'Hoppers nibbled at leaves, ate peach, left pit.
Above right — Jonathan tree, no 'hopper control applied.
Right—Nearby Jonathan tree saved by 1 spray chlordane.

Grasshopper eggs begin to hatch in early summer; and if allowed to develop normally, serious injury may be caused by mid-July. As the season progresses, the injury becomes more intense.

With a heavy population in the summer and with good conditions for egg laying in the fall of 1947, a severe outbreak of grasshoppers may be expected in 1948 unless climatic conditions and parasites operate to destroy the pest.

Control

Any treatment to give maximum protection against grasshoppers should be applied early in the development of the nymphs. The small hoppers are much more easily killed

(*Continued on page* 56)

Dr. O. H. Hammer is research entomologist with the Dow Chemical Company, Midland, Mich.

PLUM CURCULIO

Despite New Insecticides, This Awkward Armored Beetle Continues To Threaten Orchards

By EARL F. SAVAGE

Georgia Agricultural Experiment Station

THE LAST TWO seasons in the Southeast have been disastrous ones for some peach growers mainly because of heavy plum curculio infestation. If labor had been available during 1945 to pick up both the May and harvest drops, much of this damage would have been avoided. Along with this, a drain of the skilled spray labor into war industries resulted in probably one of the poorest spray jobs in two decades.

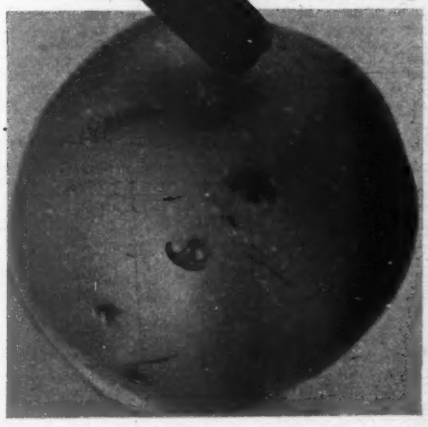
Life History of the Plum Curculio

The adult of the plum curculio is a hard snout beetle which passes the winter under grass, brush, and other trash in and around the orchard. In southern orchards Bermuda and Johnson grass are favorite hibernating places. The overwintered adults begin to appear on the trees soon after the blossoms open and are found in quantity by the time of full bloom. When the overwintering beetles first come out of hibernation, they feed on the foliage and blossom parts. The females characteristically make a crescent-shaped puncture in the fruit with their mouth parts and lay eggs in these slits. Each female deposits an average of about 50 eggs under orchard conditions. This is indicative of the number of wormy peaches that it is possible for one of these insects to cause. This is why the alert peach grower is so greatly concerned when he finds a curculio population of three to four per tree.

Present Recommended Practices

The present recommended practices in Georgia for the control of plum curculio are four lead arsenate sprays at the rate of two pounds per one hundred gallons of spray at petal fall, shuck split, fourteen-day spray (two weeks after shuck split application), and one month before ripening. The safeners, zinc sulfate and hydrated spray lime, are added at the rate of two pounds and eight pounds, respectively, per one hundred gallons of spray. These sprays alone are not considered sufficient to control the curculio commercially if the infestation is medium heavy or heavy.

Spraying must be supplemented by orchard sanitation practices. The May drops must be picked up at intervals from five to seven days. The small drops, about the size of a thumbnail, should not be overlooked as these oftentimes contain the highest percentage of curculio larvae. From a practical standpoint the orchard is kept cultivated from blossom time, or before, until wormy drops begin to fall in order to keep down weeds and grass which might interfere with picking up the drops.

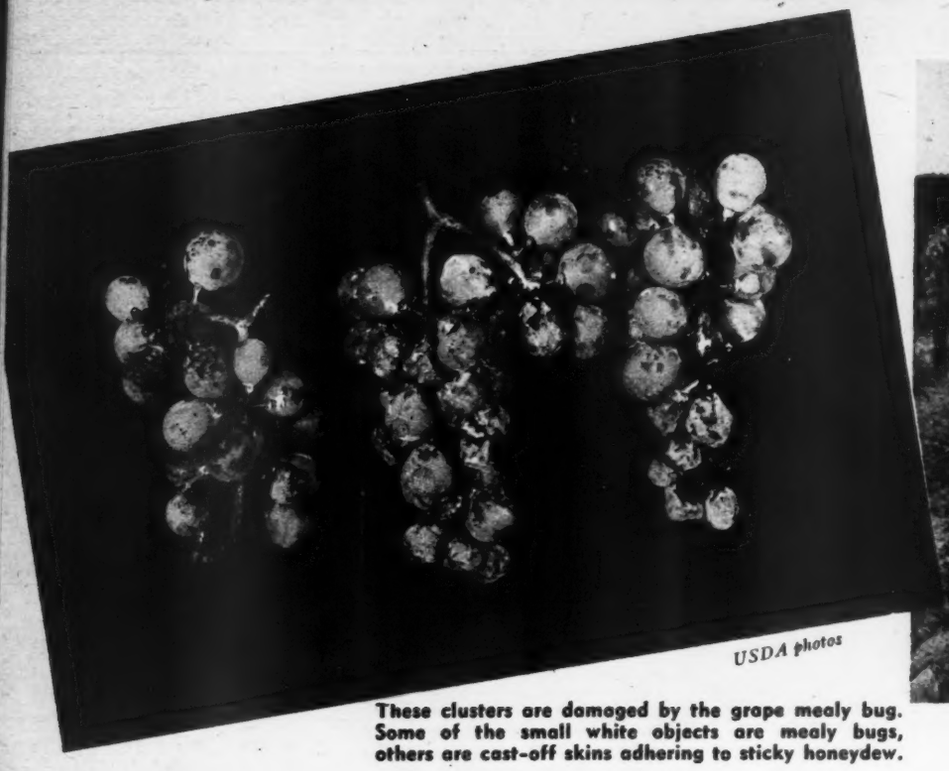


Crescent-shaped slits which females make for eggs are easy to identify.

At this point all cultivation is stopped since discing would actually aid in the entrance of the larvae into the soil.

After the last drops have been picked up, another supplementary control measure is to disc the orchard with an offset harrow to a depth of several inches, especially under the trees, to destroy curculio pupae in the ground either by breaking the soil cells or by exposing them to the elements and natural enemies. The drops should be picked up after harvest since these often contain curculio and are also a potent source of brown rot. Post-harvest sprays

(*Continued on page* 60)



These clusters are damaged by the grape mealy bug. Some of the small white objects are mealy bugs, others are cast-off skins adhering to sticky honeydew.

Hooded boom makes possible thorough coverage of all parts of the vines.

NEW PESTS FOLLOW DDT IN VINEYARDS

By WILLIAM K. STEUK

FOR MANY YEARS the standard spray program in vineyards has been based on lead arsenate as the poison, Bordeaux mixture as the fungicide, some material added as a sticker-spreader, and the off-and-on inclusion of nicotine sulphate as a contact poison. However, the grape berry worm was not universally controlled with this program. In fact, the grapes in some vineyards were so seriously damaged that they were not harvested. When nicotine sulfate was included in the spray mixture at the proper time, very satisfactory control of the grape leafhopper was accomplished. The rose chafer, a beetle feeding upon the grape blossoms, was not checked by the regular program but required a special spray containing a heavy dose of lead arsenate applied at a specific time. The grape rootworm beetle, an insect feeding on leaves as an adult and the vine roots when immature, seemed to be checked, but never controlled, by the old spray program. Vineyardists in general were eager to use DDT which proved very effective against all these insects mentioned.

Records of the percentage of berries damaged by the grape berry worm were made, for a period of years at harvesttime, in a northern Ohio vineyard. This data, given below, shows the effect of spray program changes on damaged berry levels.

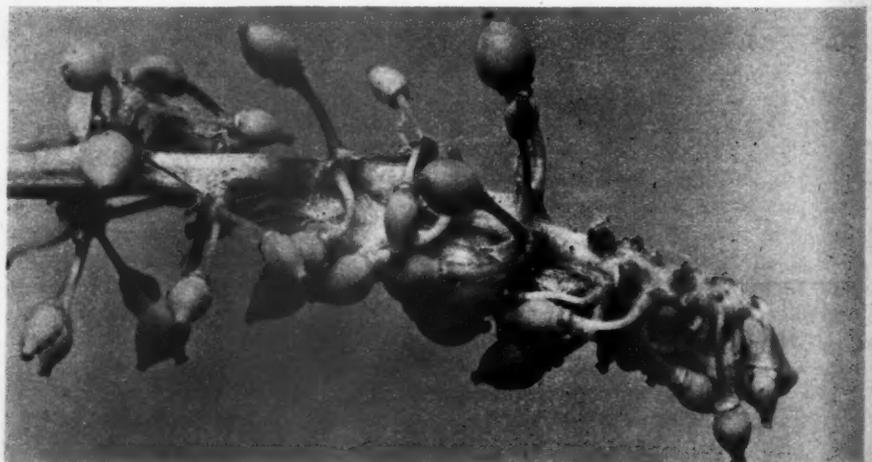
Lead Arsenate Spray Schedule

Lead Arsenate Spray Schedule	*Percent Berries Damaged*
1941	24.22
1942	22.80
1943	12.20
1944	8.84
DDT Spray Schedule	
1945	4.94
1946	.19
1947	Trace

In this vineyard during 1942, 1943, and 1944 everything was done to make the lead arsenate program more effective, such as addition of nicotine sulfate to all sprays, more and better sticker-spreader materials, more frequent spray applications, and a timing of sprays thought more efficient. In 1945, and thereafter, an exclusive DDT program was followed with the result that in 1947 there was but a trace of damage. Control of the grape leafhopper was perfect and had been so since DDT was first used.

However, this splendid record was marred by the development of other pests, some entirely new in the vineyards and others previously considered minor. These new pests are several species of mites similar to the common red spider, the European red mite, a scale insect known as the European fruit lecanium, the red-banded leaf-roller, the grape mealy bug, the

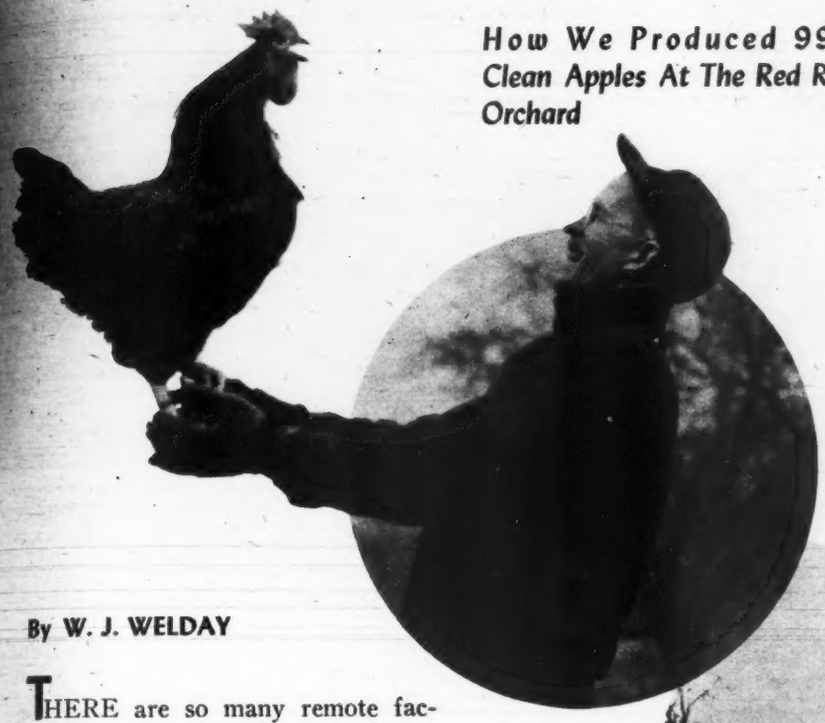
(*Continued on page* 52)



Here is a young grape cluster webbed by a larva of the red-banded leaf-roller. Feeding will occur within the area of the web, and grapes will be damaged.

SOMETHING TO CROW ABOUT

How We Produced 99.1% Clean Apples At The Red Ridge Orchard



By W. J. WELDAY

THERE are so many remote factors entering into the art of producing clean fruit that the so-called "spray schedule" becomes only a part of the procedure. A "spray program" is more what we have in mind.

As a running start for these comments, it might be said that our modest achievement of producing 99.1 percent clean fruit the past season attests to the value of orchard specialization. We could not have made that accomplishment with the disturbance of cows to milk, sheep to shear, corn to plant, etc. Orcharding is for the specialist. If apples pay, ditch the other things; if over the pull they do not pay, ditch the apples. In other words, to get results, let nothing interfere with your "spray program."

I think sometimes orchardists try to get tips on the exact amount of liquid lime sulfur to use in delayed dormant, on the merits of the speed sprayer vs the gun or boom, on the value of the power take-off vs separate power, and the worth of magnetic sulfur vs flotation as though in the answer to these lies the secret of successful spraying. In the main these things are just a matter of adaptability.

We are convinced that pruning and spray control have a vital relationship in this spray program. The "inside of the far side" can't be reached through a thick, unpruned tree. Pruning is important for various other reasons, but the orchardist would unquestionably be ahead if he thought more of pruning in terms of spraying.

The personal element is something big in the production of clean fruit. Reverting again to specialization—the general farm has "general" farm help. Specialized orcharding has specially trained help. They are better paid. They are smart enough to know that their salary depends upon profits, hence they take an interest; they are willing to work overtime in the rush seasons, including holidays, Saturday evenings, or even Sundays if necessary.

Perhaps the most significant thing about our last season's results was the relatively few sprays applied. Why put on thirteen if seven will do the trick? This result was strictly a matter of *timing. If there is any such thing as a secret, this is it!* Timing means adequate equipment and man power, machinery previously put in shape, and spray materials on hand—all "rarin' to go." If the time to start is Wednesday morning, that doesn't mean Wednesday afternoon. We could handle our spraying job with one large outfit, but we keep a supplementary one for the pinches and as insurance. Just last season we refused $1500.00 for the smaller outfit. We had a sprayer fire during scab season but put two crews on the smaller rig and operated on a 24-hour schedule. Know what you are spraying for and take no chances. Two years ago there was a lot of scab although many growers believed it was to be a so-called "scab-free" season. The scab came at the time of the ten-day spray, which had not been regarded as necessary.

As shown by the amount of brush in this photo, trees are opened up to permit thorough spraying.

Welday's orchard has always leaned to the conservative side but with its eyes open. Let the other fellow do the experimenting. It has paid dividends that we did not jump overnight into dusting, or change from liquid lime sulfur to flotation in

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ANCIENT SUPERSTITIONS IN FRUIT GROWING

By S. E. SALJE

GREAT SECRETS have always surrounded life, and seers have always sought its underlying fountain spring. As a result of this timeless searching for life's formula, myths and superstitions have sprung from the darkest corners before the seekers have penetrated with the light, and in the sphere of fruit culture a mighty lore of unusual tales has grown in the course of centuries, advising us how to treat fruit trees so that they would bear a rich crop of good fruit. We have no records which give an indication to what extent the country folk of olden times used the magic spells recommended, but one would be inclined to think that most of these prescriptions were adopted and tested by many men, at least until they were proved unsuccessful.

One seer suggested that for grafting one should cut the scion at new moon from branches growing eastward. In the book "The Clever and Sensible Old Man" (printed 1790) we read:

"How to graft:

"Go to a good pear or apple tree when it comes into sap and select a shoot that has green fresh buds somewhat smaller than the little finger. Cut the shoot from the tree, and when the buds burst, make an incision on both sides of the shoot. Then pull the wood gently out of the bark. However, before you start, you must choose a shoot of the same thickness on another tree, loosen the wood from the bark, and put the first shoot in its place. Put the remaining bark tightly around the scion, seal the union and the top with grafting wax and tie with soft bast so that no water or other liquid could enter between bark and wood. In the first year the scion will form leaves, in the second flowers, but these should be removed since the shoot is still too weak to bear fruit; however, in the third year you allow it to fruit. In this fashion you can treat both domesticated and wild pear and apple trees."

The same author tells us how to grow cherries without stones:

"If one desires cherries without stones, one should cut down a young cherry tree to one ell above the root, split the stump along its whole length, and scrape out the pith with a knife or an iron spoon. It will grow together again if it is tied well and cow dung put around it. In the next year graft on the stem a cherry scion which has never borne fruit. This will bear cherries without stones. N.B. The top of the cut and split stem should be sealed with grafting wax or grease in order to prevent the entry of liquid or water. Plums and other stone fruit may be treated in the same fashion."

"How to grow red apples:

"If you want to grow red apples, you can achieve it in this way: dip your scion into pike blood or graft it on an alder with red wood. Once the scion grows, it will bear red apples.

"How to grow tasty fruit:

"There is the possibility of making sour fruit sweet and vice-versa. If you want to produce sweet apples, you bore a hole in the stem and pour honey into it. If you want an acid taste, you pour vinegar into the hole. Then you close the hole with a plug of hawthorn. There is also another method of producing good flavor in apples. In January or in the beginning of February you give the stem two strong blows with the axe, one on each side so as to do no damage. Then wedges are driven in to widen the incisions to proper cracks which are filled with ground root or bark of pleasant taste. When the wedges are withdrawn, the cracks close again and the wounds in the bark are covered with a paste of cow dung, which in its turn is covered with a cabbage leaf and very thin birch bark. In this manner good-flavored apples are obtained."

"How to make a fruit tree flower and not shed its blossom:

"In January or early February dig a trench near the roots, pour water into it and fill it up again after the water has frozen. On Gregory's day, or later in March, dig up the trench again and break the ice that pressed on the roots. Then fill in again carefully."

By this method, one was told, the tree would be made to bloom abun-

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The above article is a translation from the original Swedish, submitted by the Imperial Bureau of Horticulture and Plantation Crops, England.

THE TREND TO SPRAY CONCENTRATES

A NEW TREND toward the use of spray concentrates is developing today as a result of recent scientific research in the orchard spray application field. This research comes in the face of today's rapidly rising costs of the spraying operation, which has set scientists looking for cheaper spray methods and chemicals. Today it seems likely that at least a dent will be made in the cost of spraying through research and experience directed along the lines of spray concentrates.

Last year an Ohio orchard pumped 900,000 gallons of spray materials on a 200 acre orchard. This is a load close to 8,000,000 pounds or 4,000 tons. It is costly and takes time to move and apply such prodigious amounts of material. The necessity for speedy coverage and accurate timing makes the job more difficult. Power, skill and perseverance are needed to control insects and diseases and grow clean fruit.

The use of spray concentrates offers growers a chance to reduce their spray load. By applying poison materials in concentrate form with application equipment which spreads the material evenly and quickly throughout the orchard, the job can be done with amounts per acre ranging from 2 to 50 gallons.

However, not every spray material will prove satisfactory for application as a concentrate. The chemical should emulsify or dissolve in water or oil (depending on the machine used for application), and the active ingredient must be concentrated in the formulation prepared for the grower. In addition there are other considerations. For instance, if the chemical is to be used in the super-heated air type applicator, it must not break down at high temperatures. The chemical must be adapted to the type of machine used in application.

A number of insecticides are well suited to use as concentrates. DDT, the dinitro compounds, the phosphate group to name a few, have given good control of particular insects in concentrate form. However, chemicals with fungicidal properties which can be used in concentrate form are few and far between. Fermate, sulfur, and some other materials have been used successfully in a limited way. The problem is one which the chemist must solve by developing new organic materials which can be used as successfully in concentrate form against fungus diseases as can the insecticides.

The growth regulators used for the prevention of preharvest drop and for weed control are well-suited to application as concentrates.

It is because the new insecticides have been proved adaptable to concentrate form of application that western growers, located in areas where fungus troubles are few, are enthusiastic about this development. However, in eastern orchards where apple scab, brown rot, and other fungus diseases are serious, the concentrate outlook is not so good. If the concentrates and the machinery available will do the job against insects, it may give those areas where fungus pests are not a problem a real advantage in competition with sections where scab and other diseases are severe.

Just as new chemicals have made possible the preparation of concentrates, so is new application equipment making possible the use of concentrates. The spray-duster (liqui-duster), the fog generator, the steam generator, the air blast atomizer or mist sprayer, to which must be added the possibility of the helicopter and the airplane, make a formidable array of new equipment. Just as confusing, in many respects, as the number of new insecticides and fungicides, are the new types of application equipment.

The easiest to understand quickly is the spray-duster which consists of a regular duster modified so that water is sprayed into the blast of dust. The fog generator, a war-born machine, consists of a blast of super-heated air into which is injected a thin stream of oil in which the insecticide or fungicide has been dissolved.

The steam generator produces a steam fog which accommodates water-soluble materials, but requires emulsion forms if oil is used.

The air blast atomizer, or mist sprayer, atomizes the concentrate by means of a blast of air over many small nozzles.

The chief difficulty is developing a machine which will give uniform deposits of concentrates and good coverage under normal daytime conditions. The size of the particle produced by the machine has a definite bearing on its effectiveness. Such finely divided materials, which are ejected from some of these machines in fog-like or vapor-like clouds, are subject to wind currents and eddies which make them difficult to place just where they are wanted. The result is that one tree or a section of a tree may get a good application while its neighbor may get little or none. Night spraying when the air is calm has been found most satisfactory.

At Summerland, British Columbia, James Marshall and J. R. W. Miles

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WHAT IS NEEDED FOR BETTER SCAB CONTROL?

A Symposium Of Grower Opinion

Protect Leaves During Rain

By E. STUART HUBBARD

Poughkeepsie, N. Y.

Our first step in scab control is pruning the trees to be less than twenty feet in height and removing weak, drooping wood to permit spray, dust, air and light to pass to the inside of the tree.

Aphid-susceptible varieties receive a DN dormant spray. All varieties are sprayed with oil-bordo as soon as green tissue is sufficient for scab infection. The drip from these sprays may lessen primary spores somewhat.

From delayed dormant until late petal fall, we depend almost entirely on micronized dust for scab protection. We aim to keep the unfolding tips on part of the orchards protected ahead of each rain period so that we can cover the rest of the orchard after rain starts but before the safe period ends. We frequently dust every other row depending on the drift to give a light cover to the alternate rows. Should rain continue so as to threaten to wash off the thin coating we come back over the undusted rows, thus also adding to the cover on the first dusted rows. It often happens that the rain is so light, or ends soon enough, that the initial dusting is sufficient. We are not so much concerned with the elapsed time between applications as with letting no newly unfolded leaf go through a rain period unprotected. We concentrate on the tips, for the lower and inside leaves and fruit retain some sulfur from previous applications and receive some which is washed from upper leaves.

Should any tree go through a rain period unprotected, we cover it with a fine mist spray of dry lime sulfur within 36 to 48 hours.

We aim to eliminate primary infection so completely that fungicides for scab can be omitted after early June. Failing this, the scab spots in the leaves are checked with dry lime sulfur in cool temperatures and fruits are kept covered with fermate or coarser sulfur.

There are indications that a high nitrogen level in the tree, especially where chemical nitrogen or fresh manure are used in the spring, or where an excess of mulch may have been applied, renders the tree more susceptible to scab.

There are also indications that trees grown with moderate applications of mulch and rotted manure or manure applied in the late fall and winter become increasingly less susceptible to scab as the natural friendly fungi and bacteria become established and increase about and in the tree roots.

As our orchards grow older, the soil becomes affected by the sulfurs, arsenicals, coppers and other chemicals to such an extent that plants cannot grow normally in this soil and our natural population of bacteria, fungi, algae, protozoa, worms and insects lessens or vanishes.

Our greatest need is for organic materials that can control our insects and diseases while we are rebuilding our humus and the life within the soil. It seems that our troubles increase in proportion to the loss of humus and the increase of unnatural forms of plant food.

Determination Essential

By H. M. PLATTS

Hampton Falls, N. H.

Apple scab is the major threat to successful apple production in New England. Successful producers in this region recognize this fact and succeed in controlling it, using the materials and equipment that are available.

Knowing the danger of scab and possessing a strong determination to lick it is the answer to the problem. Materials and equipment are adequate for this control but, of course, improvements are welcome and should be a constant problem for everyone concerned.

Bogging down is an obstacle but not so formidable that it cannot be overcome. A crawler-type tractor can pull a duster through some mighty wet orchard.

During scab infection periods foliage must be covered. Dispatch and thoroughness in spraying and dusting, as in any job, is the only key to success. Mistakes and bad judgment can result in poor control, and at the same time, they can strengthen a grower's determination.

More Research Needed

By GEORGE G. FARLEY

Albion, Mich.

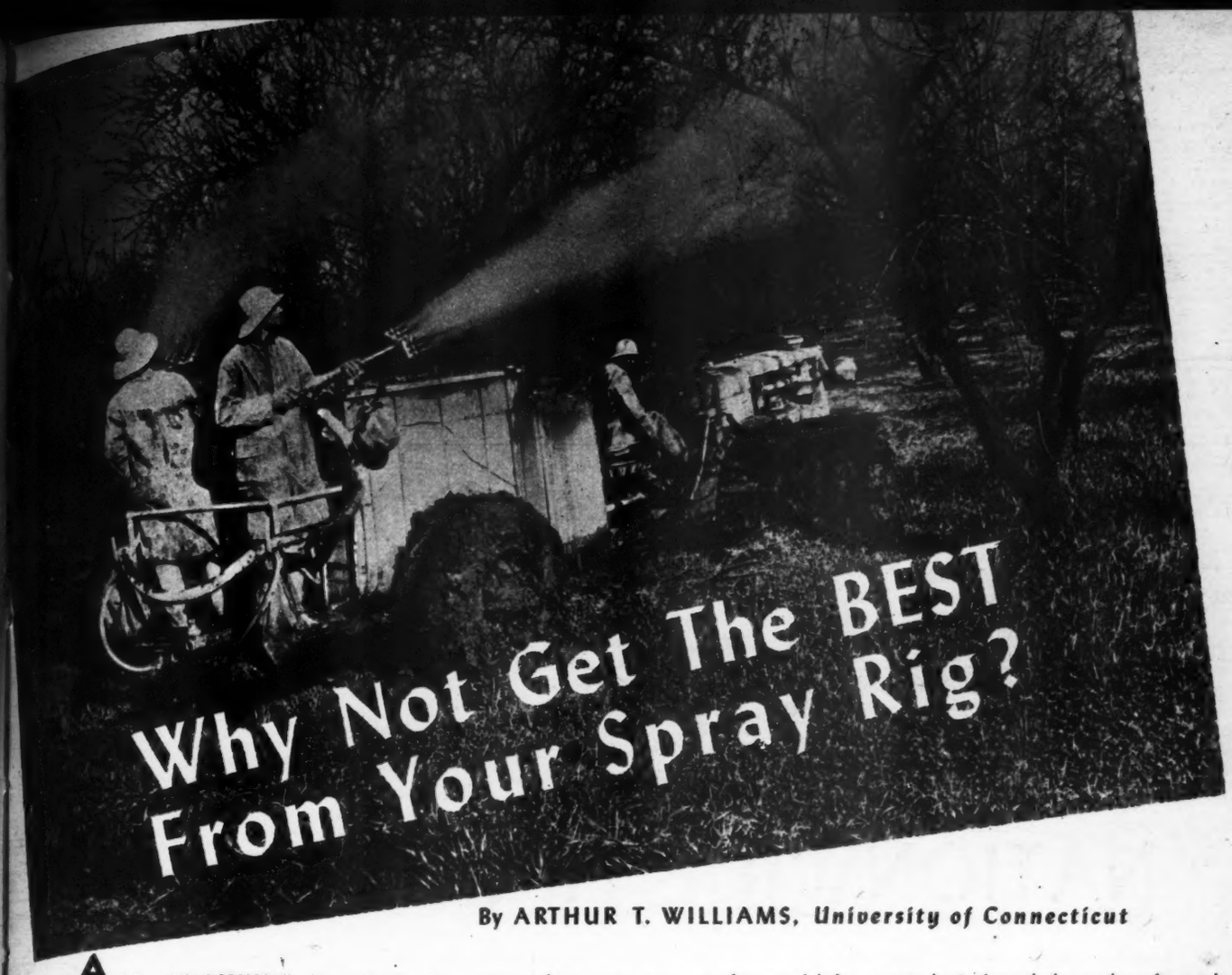
Almost every apple grower learns a little more about scab control as time goes on. If every season were alike, this knowledge would have more accumulative advantages. But because every succeeding season is different and unpredictable, the greatest knowledge that can come to the grower is found in his total perspective and ability to make last minute decisions.

Success in scab control apparently involves fundamentals of character in the grower, and in his close associates in the business. There is no substitute for perseverance, no alternative for correct decisions about timing, no known modifications for careful coverage.

If modern equipment and improved chemicals have made timing and coverage easier to accomplish, this is commendable. Fast up-to-date tractors may work better than the old models, may get the job done ahead of the neighbors, but this extra speed may be disastrous.

Coverage is a constant demand. It always must be brought up to a new level to keep pace with new growth. Early season efforts will be rendered futile by lapses from constant vigilance. Indifference is a temptation, as spraying becomes a monotonous routine, and as the so-called safety date comes closer.

(*Continued on page* 66)



Why Not Get The BEST From Your Spray Rig?

By ARTHUR T. WILLIAMS, *University of Connecticut*

ALL GROWERS intend to do a good job of covering their trees every time they go over them; however, good coverage depends on several factors, all of which influence the job on every spray application for every grower. Even though air blast, mist concentrate, and fixed-boom sprayers are gaining favor and creating new problems of rig usage, a large majority of growers will be using conventional or so-called "hydraulic" rigs for many years. Therefore, there is still plenty of time to tune up the old rig.

The factor in which we are interested at present is that of appropriate spray gun equipment adaptation. Appropriate adaptations should bear on three objectives: 1. To use capacity of spray pump whether it be single gun, broom, or more than one of either; 2. To use labor efficiently on any particular block under existing weather conditions with any size rig; and 3. To cover trees under any necessary spraying conditions, considering weather, size of rig, and size of trees.

In regard to the first objective, Table I indicates the appropriate disc sizes to use to accomplish any desired spray discharge. For single guns, the figures can be taken as totals, but for more than one gun or for multiple nozzle brooms the sum of any figures from Table I must not exceed the rated pump capacity. Incidentally, the primary fact that a grower must know is the rated capacity of his spray pump and, if possible, how nearly to capacity that pump will work. There may be exceptions to this pump capacity rule, but the principle is generally sound for present rigs and labor use.

Table II indicates how much pressure loss (with accompanying loss of capacity) there is in various hose sizes, with varying length and flow combinations. This suggests that, for any capacity (or flow) of more than 10 gallons per minute at 600 pounds pressure, as short a lead of ¾-inch hose as possible should be used. Growers are losing a great deal of capacity and spray quality by using 25 to 50 or 75 feet of ½-inch hose. They should avoid using long hose for high capacity rigs and for "from-the-rig" spraying. From Table I, we can fig-

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TABLE I

AVERAGE SPRAY DISCHARGE IN GALLONS PER MINUTE FROM VARIOUS-SIZED DISC OPENINGS.

(To determine output from a broom, multiply figure under pressure column that you use, opposite disc size being used, by number of nozzles on broom.)

Disc Hole Size (inches)	General Disc No.	Per Nozzle Gals.-Per-Minute Discharge at Pounds Pressure						
		200	300	400	500	600	700	800
1/16	4	1.2	1.4	1.6	1.9	2.1	2.2	2.5
5/64	5	1.8	2.2	2.5	2.8	3.1	3.3	3.5
3/32	6	2.5	3.	3.4	3.8	4.3	4.6	4.8
7/64	7	3.3	4.	4.6	4.8	5.3	5.8	6.1
1/8	8	4.3	5.5	6.1	6.9	7.4	8.	8.5
9/64	9	4.9	5.6	6.5	7.7	8.4	9.	9.6
5/32	10	6.8	8.3	9.6	10.6	11.5	12.3	13.
11/64	11	7.6	10.	10.5	12.1	13.	13.9	14.7
3/16	12	9.4	11.2	12.7	14.5	15.6	16.7	17.7
13/64	13	11.4	13.1	15.3	17.	18.6	19.9	21.1
7/32	14	12.3	14.8	17.2	19.2	20.9	22.4	23.7
15/64	15	14.1	16.9	19.7	22.3	24.3	26.	27.6
1/4	16	15.4	18.6	21.5	24.7	26.9	28.8	30.5
17/64	17	18.1	21.6	24.5	27.7	30.2	32.3	34.2
5/16	20	22.4	26.9	30.7	34.7	37.8	40.4	42.8

Tables I, II, III, and IV which are used with this article were developed at Michigan, New York, and other state Agricultural Experiment Stations in cooperation with manufacturers of spray equipment.

NATIONWIDE FRUITS

APPLES

● **A Golden Delicious apple** which shrivels in storage loses much of its sales value. However, shriveling of Golden Delicious is overcome, according to the Ohio Experiment Station, by the use of ¼ pound of shredded oil paper in a bushel of apples. Recommended also for other varieties, shredded oil paper is especially essential when storing Golden Delicious.

● **A tasting panel** of judges at Geneva, New York found that the Cortland produced the best baked apple for frozen storage. When compared with seven other varieties, not only was the flavor superior, but the color was also rated good. Rome Beauty, Baldwin, and Red Twenty-Ounce were also rated high.

● **A recent survey** completed by the U. S. Department of Agriculture in which samples of apple juice were analyzed and graded reveals a trend away from deaeration and toward the use of the centrifuge and ascorbic acid. No apparent relationship was found between the flavor score in June and the variety of apples used, treatment before pasteurization, the type of container, deaeration, the use of ascorbic acid, filtration, whether the juice was clear or cloudy, or the size of the processing plant. The report concludes with the statement that rapid cooling to 70° or below and storage at much lower temperatures helps preserve the flavor of the juice.

Meanwhile, at the New York Experiment Station it has been found that spraying the pomace immediately after milling and before pressing with a solution of ascorbic acid in apple juice delays discoloration giving a light-colored juice which does not have a cider or cooked flavor and is more typical of fresh apple juice; this raises the question as to whether the public, accustomed to an amber-colored apple juice, will accept this delicate-flavored, light-colored juice. New York scientists also stress the fact that flavor depends on the flavor of the fresh apples and that only good quality, mature apples, washed free of dirt and spray residue, should be selected for pressing.

At the same time the Ohio Experiment Station reports that variations in flavor may be one of the main reasons for the public's indifference to apple cider as a beverage, and they recommend using a blend of sweet and acid apples. Varieties with a rich aroma also add a desirable characteristic, and juice from bland apples such as Rome and Ben Davis may be used for as much as one-half of the total volume provided sharp juices from other varieties are included.

PEACHES

● **Fumigated soil** and resistant cover crops are promising new control measures for damage done to peach trees by the nematode causing rootknot according to the U. S. Department of Agriculture. Experimental plots were fumigated with chloropicrin permitting the young tree to form a healthy root system and to get established quickly. The yields from the fumigated plots with resistant cover crops were more than eight times as great as those from untreated trees.

Photo by Parks, Standard Oil Co. (N.J.)

• **Ultra-violet rays** have been very effective against bacteria, but they are not of value in protecting fruit against decay in shipment and storage. Tests made by the U. S. Department of Agriculture show that the installation of lights in storage rooms to kill molds and bacteria in the air are of doubtful benefit because to be effective the germicidal light must strike all surfaces of the fruit which is difficult to do in a storage room.

BERRIES

• **A highly destructive pest** which attacks berries has moved in on several counties in Washington causing serious damage to raspberries, boysenberries, and other kinds of cane berries. One crop of 20 acres was ruined by this pest.

According to Washington State fruit specialists the adult moth flies from one plant to another, laying its eggs on the leaves of the new growth of canes; the worm feeds on the leaves and later gets into the fruit. It is believed the insect was introduced from the California orange groves where it is known as the "orange tortrix." A satisfactory control measure has not been found although DMT—Dimetoxy dichloroethane—and cryolite have given fairly promising results.

• **Fairland,** a new, early, red-stele resistant strawberry variety for northern states is being introduced by the U. S. Department of Agriculture and the University of Maryland. The fruit is large, light bright red and somewhat firmer than either Howard 17 or Catskill but neither so firm nor so highly flavored as Temple. It was selected in 1938 from a cross between Aberdeen and Fairfax and has been widely tested as US-3205. Tests indicate that Fairland is best adapted to the region where Howard 17 is an important variety—New England and New Jersey west to Missouri.

• **The airplane** is again proving its value in agriculture. It has been used in spraying and dusting, and now the New England Cranberry Sales Co. is employing the helicopter to fertilize its cranberry bogs. This fertilizer program resulted when the company found that aerial work would be more economical if the plane could be used for another purpose after the dusting season was over. Trials so far have been highly effective.

AVOCADOS

• **Avocado seeds** were first brought to this country by Spanish adventurers shortly after their conquest of the New World. Commercial groves,

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HOWDY, neighbor, come on in and set a spell. I'll kinda scrootch over and let you sit down here closer to the stove. There's been lots happened since you was here last.

I heard tell that the Union Pacific railroad's been buyin' new refrigerator cars as fast as unsprayed apples fallin' off of trees. Yup, when they're all delivered, the U.P.'s Pacific Fruit Express'll have 41,000 refrigerated cars. Guess that's the biggest bunch of reefers for one company in the whole world, huh?

Speakin' of the world, they've been doin' all kinds of new fangled things over in England. They're feedin' trees iron in pills and have a new pill pusher dingus to shove 'em into holes in the trunks. Guess it's the same idea as feedin' kids spinach, only I guess the trees don't mind it so much. You say you heard of feedin' trees pills over here, too? Well by cracky! What is the world comin' to?

Tarnation, but the fruit growers are usin' a lot of water these days! Read the other day about a Major H. C. Moore out in Cherokee County, Tenn., usin' a million gallons of water in a week's time irrigatin' his 30-acre orchard. Claims it's the same thing as an inch of rainfall. Pumped all that water with a portable irrigation plant, folks say. And speakin' of gallons, there's a place in Fairfield County, Ohio — Sand Hill Fruit Farm, they call it—where they used 900,000 gallons of spray materials in 10 applications this year. That's a whoppin' lot of water and chemicals, but heard tell it sure pays off in profits.

You know about pears—how hard it is to get 'em pollinated sometimes? Heard tell that's because the sugar in some pear flowers is as low as 4 percent, and honey bees like sweeter blossoms like peach. Peach flowers have about 30 percent sugar in their nectar. Those bees know what they're doin', I guess. Some folks say the bumble bee is a better pollinator than the honeybee, because he has a longer tongue. Guess they have somethin' to bumble about, don't they?

Well, guess it's time to turn in again. By cracky, how the time skitters by, don't it? So long for now!

MORE ON BORON

BORON PREVENTS INTERNAL CORK IN APPLES, BUT MUST BE USED WISELY

By MARK H. HALLER

United States Department of Agriculture

IN RECENT YEARS it has been demonstrated that the physiological disease of apples known as internal cork is a sign of boron deficiency in the tree and soil. When the boron content of the fruit is less than 7 to 10 p.p.m. (parts per million dry weight basis) internal cork in susceptible varieties such as Ben Davis, McIntosh, Yellow Newtown, Rome Beauty and others is likely to be prevalent. When the boron content is greater than this, the apples do not develop internal cork. Soil deficiencies can usually be corrected by the addition of relatively small quantities of boron in the form of borax or boric acid (usually one pound or less per tree is sufficient for mature trees). Furthermore, a single application of borax may maintain the boron content of the fruit above the deficiency level status for several years.

Although small amounts of boron are essential to plant growth, boron has also been shown to be toxic to many plants when applied much in excess of that amount necessary to correct a deficiency. The quantity necessary to cause injury to apple trees has not been well-established. The fruit appears to be more sensitive to both a deficiency and an excess of boron than are other parts of the tree. Deficiency symptoms or toxic effects may occur in the fruit when other parts of the tree are not affected.

Storage investigations with apples from boron plots, conducted at the Plant Industry Station at Beltsville, Maryland, have thrown some light on this question. These tests were carried out in orchards in which the boron content of the untreated apples was somewhat greater than 10 p.p.m. No internal cork was found present.

When ⅓ of a pound of borax per tree was applied to the soil under eight-year-old Jonathan trees in the spring of 1940, the boron content of the harvested fruit was increased to over 50 p.p.m. and there was a serious increase in the break-down of the treated fruit during storage. An additional 1/6 of a pound of borax was applied to the same trees in 1941, and the boron content of the fruit went up to over 80 p.p.m. and more than 30 percent of the apples developed break-down in storage, compared with less than 1 percent in apples from the untreated trees. The apples from the treated trees developed twice as much break-down as those from the untreated in 1942 even though no additional borax applications were made during this season. Similar results with Jonathan have been obtained in New Zealand and show that this variety is very sensitive to boron injury.

Eight-year-old Rome Beauty trees given the same treatment as the Jonathan also developed more break-down in the apples from the borax-treated plots. Although the break-down was not as severe as in Jonathan, the differences were consistent, an average of about 3 percent of the apples from the untreated plots being affected, and 10 percent from the borax plots during the three seasons. However, with Rome Beauty the loss due to break-down was counterbalanced by a reduction in the amount of storage scald. No appreciable amount of break-down developed in other varieties tested (Grimes Golden, Delicious, York Imperial and Yellow Newtown).

Considerable scald was present on Grimes Golden, Delicious, and York Imperial apples that were studied for their response to soil applications of borax. In these three varieties the fruits in which the boron content was increased to over 40 p.p.m. by the borax treatments showed an appreciable reduction in the percentage that developed scald during storage. In these varieties there was no evidence of boron deficiency insofar as internal cork was concerned, and from the standpoint of storage quality they showed a benefit from borax applications.

The practical conclusions from these findings are:

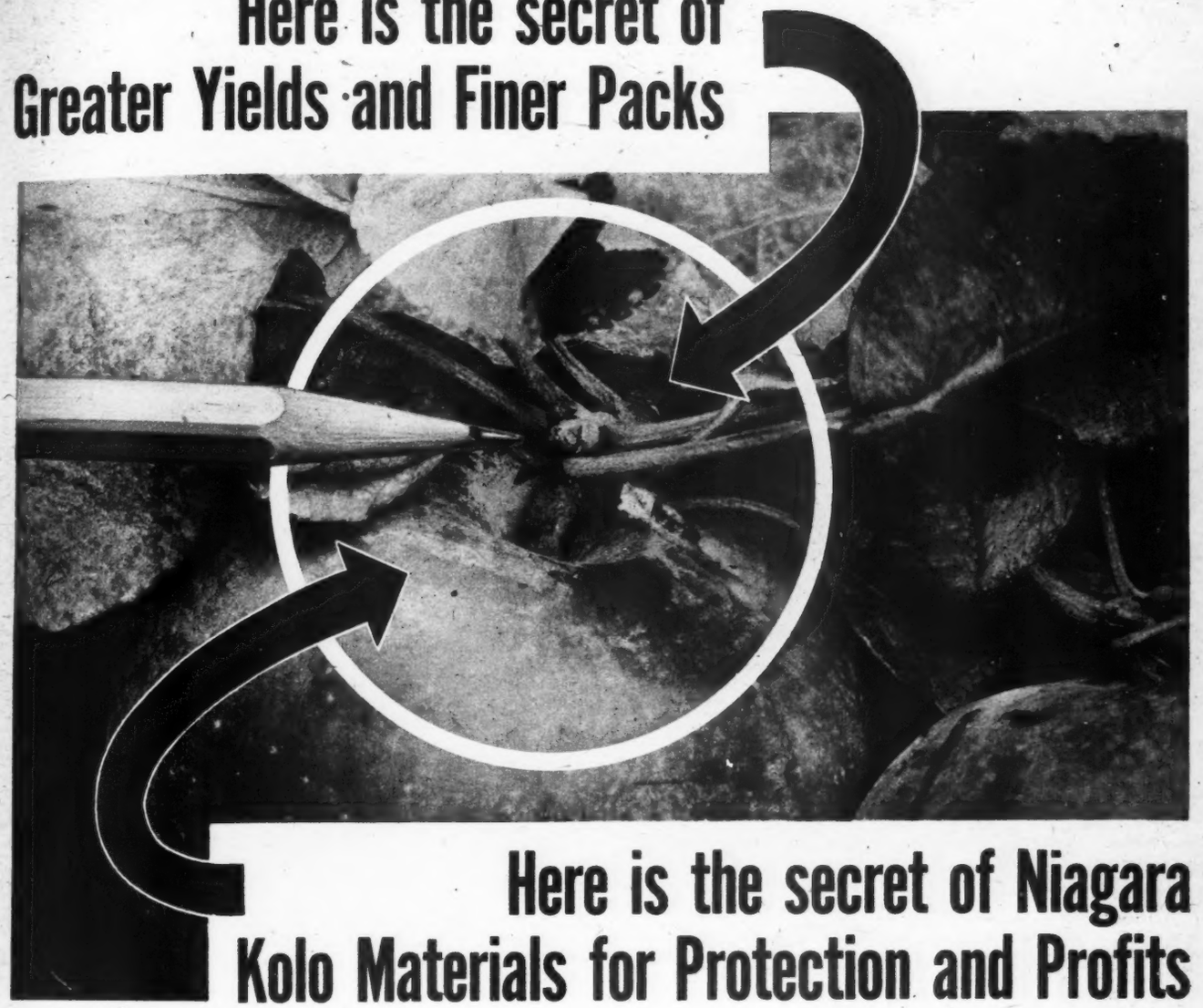
1. Boron applications reduce storage scald in apples where the deficiency is not severe enough to cause internal cork. Under such conditions, benefit from borax applications may be obtained with varieties that are susceptible to scald, such as Grimes Golden, Delicious, York Imperial, and possibly others, such as Baldwin, Stayman Winesap, Arkansas, and Rhode Island Greening. However, the latter varieties have not been tested to determine their response to application of borax with respect to storage scald and break-downs.

2. Applications of borax should not be made indiscriminately, as they may increase storage break-down in certain varieties, particularly Jonathan and possibly Rome Beauty and McIntosh.

3. Borax applications should be regulated by the boron content of the fruit. The amount of borax necessary to correct a deficiency will depend on the extent of the deficiency, the age of the trees, variety and probably soil factors. If analysis of the fruit in the fall shows the boron content to be less than 10 p.p.m. (dry weight basis), it is suggested that ¼ pound of borax per tree should be added the following spring for each 10 years of age of the trees. With a boron content of 10 to 20 p.p.m. the application should be only about half as much or ⅛ pound per tree, per 10 years of age. With a variety such as Jonathan the boron content probably should not exceed 20 to 25 p.p.m. to avoid boron injury that shows up as internal break-down during storage. With Grimes Golden, Delicious, York Imperial, and Stayman Winesap the boron content of the fruit may be increased to as much as 50 p.p.m. which reduces their susceptibility to storage scald with no apparent injury to the fruit.

4. There has been some indication that borax applications to soils, where no deficiency was apparent, may hasten (a) changes in ground color from green to yellow, (b) development of red color, and (c) harvest dropping. The use of harvest sprays to retard dropping might be called for where borax is applied.

Here is the secret of Greater Yields and Finer Packs



Here is the secret of Niagara Kolo Materials for Protection and Profits

Top quality fruit and healthy buds on the same tree during the same season—that is what successful fruit growers strive for. But it isn't easy! It means intelligent planning and constant work. And Niagara KOLO PRODUCTS provide perfect assistance to thousands of progressive growers.

FUSED BENTONITE SULPHUR is in every tiny particle of Niagara KOLO materials. Each minute unit is sulphur-bearing and highly toxic to fungus spores. And because Niagara KOLO products are *non-caustic,* they permit normal development of tender foliage and more fruit buds for the next year's crop.

Here is a successful program for apple scab control using Niagara KOLO materials:

1. Accurate timing of applications (just ahead of or during infection periods).
2. Sufficient dependable equipment to cover acreage quickly rain or shine, day or night.
3. Dependable adhesive materials which will maintain protection during prolonged rains, at the same time allowing leaves to function normally.

These are the Niagara KOLO materials which will give you higher yields—better quality packs—greater profits:

Niagara KOLODUST—Apple scab spores are most active in the rain—*so is KOLODUST!* It spreads and adheres in the rain, thus preventing scab from getting started. Can be used on dry foliage ahead of infection periods.

Niagara KOLOFOG—Positive in action against fungus attacks, at the same time favoring fruit bud and optimum leaf development. Adhesive, wettable, non-caustic. An excellent carrier for insecticides.

Niagara KOLOSPRAY—Possesses high fungicidal value with excellent spreading and adhesive properties. Non-caustic, it protects fruit and foliage against most diseases without injury to foliage. Also an excellent carrier for Lead Arsenate, DDT, BHC, etc.

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State NEWS

- **Resourceful Growers Devise Time-Savers**
- **Massachusetts Favors Grade Revisions**

COLORADO — The Western Colorado Horticultural Society held their fifth annual meeting January 9 and 10. The two day meeting featured many speakers discussing the latest developments with horticultural and agricultural crops.

P. W. Eames

A very important part of this year's program was the subject "soil fertility in relation to crop production." Speakers included the following: Dr. Thomas L. Martin, Dean of College of Applied Science, Brigham Young University; Ivan D. Wood, Extension Irrigation Specialist, Soil Conservation Service; A. F. Hoffman, Jr., Soils Specialist, Palisade, Colorado.

Also Ralph M. Weihing, Associate Agronomist, Colorado A. & M. College; J. H. Newton, Associate Entomologist, Colorado A. & M. College; Dr. Dwight Powell, Dept. of Horticulture, University of Illinois; Leslie B. Daniels, Associate Entomologist, Colorado A. & M. College.

Also Charles M. Drage, Extension Horticulturist, Colorado A. & M. College; Harry J. Eustace, Farm Market Relations, Inc., San Francisco; Curtis Watkins, Sr., Kansas City; B. W. Rubeck, Food Machinery Corporation, George W. Kelly, Horticulturist, Colorado Forestry and Horticulture Association.

Dr. I. T. Whitman, Sherwin-Williams Co.; R. M. Bullock, Washington State College; Charles Weddle, Pan American Seeds, Inc., Gilbert Blanchard, Peonia, Colorado; and Prescott W. Eames, Orchardist, Grand Valley, Colorado.—*C. A. Dewey, Western Col. Hort. Soc., Grand Junction.*

CONNECTICUT—The 57th annual meeting of the Connecticut Pomological Society, Dec. 11 and 12 at Hartford, marked the 50th anniversary of Harry C. C. Miles as secretary of the Society. Retiring President, Orrin P. Kilbourn, in a surprise ceremony presented Miles with an album of best wishes and a huge cardboard check for $601.94 as a token of esteem and affection. Secretary Miles promptly responded with acknowledgment of his appreciation and in characteristic generous fashion announced his intention to place the check in the scholarship fund of the Society.

Dr. Philip Garman of the State Experiment Station was also honored. He received the 1947 Honorary Recognition Award of the Society from former President Harold M. Rogers.

Officers for 1948 are: president, Harry Cooke; vice-president, Henry F. Joy; secretary, H. C. C. Miles; treasurer, S. L. Root.

GEORGIA—The high price as well as scarcity of labor is rapidly forcing greater mechanization by Georgia Peach Growers. Fewer and fewer men are being used in the actual production of peaches. Along with the rest of the fruit growing areas of the nation the spraying and cultivating operations have become much more efficient with the advent of new types of spraying and cultivating machinery. The thinning operation has been greatly simplified by many Georgia growers by the use of 14-16 inch sections of rubber hose to break clusters of peaches. One grower has found one pound rubber mallets procurable in almost any automotive supply store to be his best way of thinning. Using this method the ordinary peach tree may be thinned in about one minute by one man. Obviously the peaches are not so well spaced as by hand thinning, but it is economically the more practical means of thinning and a very great labor saver.

The number of hours of cold 45° F. or below up until the middle of January was well over 1000 in Central Georgia. With a requirement of only 1200 hours of cold for Elbertas and prospects of considerable more cold weather, there is little danger of the rest period not being broken in 1948. Through January 15 there has been no perceptible injury to fruit buds.—*Earl F. Savage, Ga. Expr. Exp. Sta., Experiment, Georgia.*

IOWA—One of our fruit growers, Marvin Faeth of Fort Madison, set out about 20 acres of apples the spring of 1946. He rigged up a long marker similar to the marker on a corn planter, attached it to his tractor, and with it marked off the location of each tree, with a considerable saving of time. To dig the holes he secured the use of a machine used to dig telephone pole holes. He also ran this with his tractor. He dug the holes about 18 inches deeper than he would for planting. With a spade he widened the top of the hole, letting the top soil fall into the hole. In this way he had better soil for the roots and saved considerable time and labor in the hardest work connected with planting.—*H. E. Nichols, Prof. of Horticulture, Ames.*

KENTUCKY—Efficiency in any farm program of labor is governed by having a balanced farm program. Kentucky is not recognized as a fruit producing state, but our most profitable fruit farming comes on a well-diversified farm featuring the family-sized orchard of 6 to 15 acres of apples or peaches, or both, with local sales direct to the consumer. Most of our farms have a small tobacco base, and many have a small acreage of strawberries along with a reasonable amount of livestock—depending on the size of the farm. This type of farm program gives a 12-month distribution of necessary farm labor.—*W. W. Magill, sec'y-treas., Kentucky Hort. Soc., Lexington.*

MAINE—Efficiency in orchard practices is becoming increasingly important to Maine orchardists. Many owners will do all possible this year to do more with less hired labor. The spray boom or mast is something to think about in saving man hours. This past year one grower with a spray mast mounted on front of his tractor did the spraying which formerly required three men. Also, making sources of water supply near the orchard has saved several growers the added expense of hauling water to the sprayer. In 1947 in the bearing blocks, Berry Hill Orchard Co. spread nitrates and lime with a rebuilt old model Bean duster. It worked very satisfactorily, and control of the broadcast was good. Two men were able to do all of the fertilizing in less than half the time required by four men.—*Rockwood N. Berry, sec'y, Maine State Pomological Soc., Livermore Falls.*

MASSACHUSETTS—One of the many interesting features of Massachusetts Fruit Growers' Association meetings, held in January at Worcester, was the report of the Market Quality Committee. This committee sent out questionnaires to 112 Massachusetts growers who represented small as well

SECRETARY MILES HONORED

In honor of a half century of service as secretary of the Connecticut Pomological Society, President Orrin Kilbourn (left) presented Secretary H. C. C. Miles with a Memory Book of best wishes and other gifts at the annual meeting in Hartford. Mrs. Miles is shown in center above.

Look for the leaf on the Package.

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BLACK LEAF 155 — the fixed nicotine product for control of codling moth, grape berry moth, leafhoppers, citrus thrips and similar pests. It dries and sticks through driving rains.

Black Leaf 40 and nature work together in controlling aphids, leafhoppers, leaf miners, most thrips, and similar sucking insects — assuring "Protection Plus."

Spraying with Black Leaf 40 kills these pests, but spares their natural enemies such as lady beetles, aphid lions and other parasitic insects and larvae.

Black Leaf 40 does double duty — kills by contact and kills by fumes. It is compatible with other standard spray materials, saving time and money in application.

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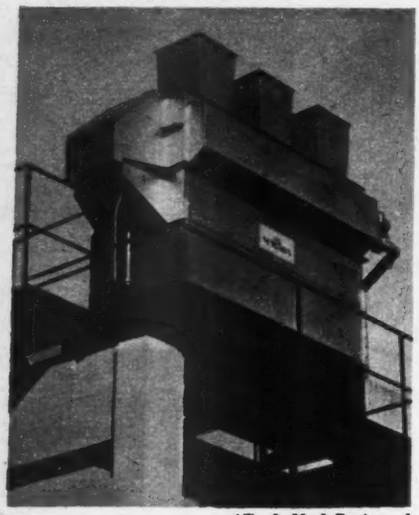

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1. **"Balanced Wet Bulb Control" holds compressor head pressure at the minimum—saving power.**
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AIR ENGINEERING EQUIPMENT

STATE NEWS

as large growers. The committee was anxious to find out what the growers were thinking in regard to the Massachusetts Apple Grading Law. The questions asked were: (1) Should the Massachusetts Apple Grading Law be revised? (2) Should the so-called "Massachusetts Grades" be eliminated so that the law would include U. S. Grades only? (3) Should the grading law apply to retailers as well as growers? (4) Should the grading law be rigidly enforced? (5) Should the marking of the grade on an open package be compulsory? Replies were received from 67 growers who represented a volume of 750,000 bushels of apples, which indicated that the survey was a good representative sample of the industry. The final tabulation of the survey found 75% of the growers voting yes on question No. 1. The vote on question No. 2 was 80% yes, on No. 3, 92% yes, on No. 4, 95% yes, and on No. 5, 81% yes. The results of the survey indicate that the majority of Massachusetts apple growers believe that the present Massachusetts Apple Grading Law should be revised and the so-called "Massachusetts Grades" should be eliminated. They also believe that the law should apply to retailers as well as growers and it should be rigidly enforced. They would also like to see that the marking of the grade on a closed package be made compulsory and included in the revised law. This survey shows that Massachusetts apple growers are wide awake to the fact that better apples must be placed before the public if Massachusetts apples are to hold their own with apples from competing areas and other fruits.—*W. D. Weeks, University of Massachusetts.*

MICHIGAN, Jan. 25—More than 6,000 growers attended the recent Michigan State Horticultural Society annual meeting convening Dec. 2, 3 and 4 at Grand Rapids. This meeting, which is one of the largest in the Midwest, attracted over 2,000 growers a day for the three-day session, and many growers brought their wives and families. At the annual business meeting George Farley of Albion was reelected president; Herbert Nafziger of Benton Harbor, vice-president; Randolph B. Monroe of South Haven, treasurer; H. D. Hootman of East Lansing, secretary. Members of the executive board are L. A. Spencer of South Haven, E. J. Robinette of Grand Rapids, John

At the Connecticut Pomological Society Annual meeting, Harold M. Rogers, Southington, made 1947 honorary recognition award of the Society to Dr. Philip Garman of the Conn. Agr. Exp. Station while Mrs. Garman looks on.

Rickert of Shelby, D. B. Button of Farmington, David R. Murray of Traverse City, Ransom Braman of Greenville, and H. B. Tukey of East Lansing. Resolutions committee appointed by President Farley were E. J. Robinette of Grand Rapids, T. C. Stebbins of Cheboygan, and J. Woodman of Paw Paw.

A review of the 1947 season in southwestern Michigan was given by Herbert Nafziger to open the speaking program. Lloyd M. Turk of MSC discussed orchard mulch, Minard Farley, Jr. explained the season's apple advertising program, and Dale Dunbar of Swanton, Ohio spoke on water wells for irrigation. Poison bait for the control of red-legged grasshoppers was discussed by Ray Hutson of MSC while A. B. Burrell of Ithaca, N. Y. talked on apple scab control. A. E. Mitchell and Donald Cation of MSC spoke on brown rot control on peaches, Dave B. Perrine of Centralia, Ill. compared peach production in 1900 with recent years, Charles L. Hammer of MSC talked on growth regulators, Walter Toenjes of Graham Station told of pre-harvest drop experiments with toloxy, and John Davidson of South Haven talked of blossom thinning sprays for peaches.

Various phases of spraying, a vital concern of growers, were discussed at this meeting. Ray L. James of MSC warned growers to be careful with poisonous sprays, C. A. Langer of MSC talked on oil-wax emulsion sprays, C. L. Hammer of Dow Chemical discussed control of the eye-spotted bud moth with DN compounds, and H. L. King of MSC talked of a new material, 3422, which was said to give good control of the red-banded leaf roller. H. B.

WISCONSIN-MINNESOTA JOINT MEETING

William F. Connell, president of the Wisconsin State Horticultural Society (left) and Wm. A. Benitt, president of the Minnesota State Horticultural Society (right) point to the relative merits of Wisconsin and Minnesota apples at the joint meeting of Wisconsin and Minnesota apple growers, while H. J. Rahmlow, secretary of the Wisconsin group looks on.

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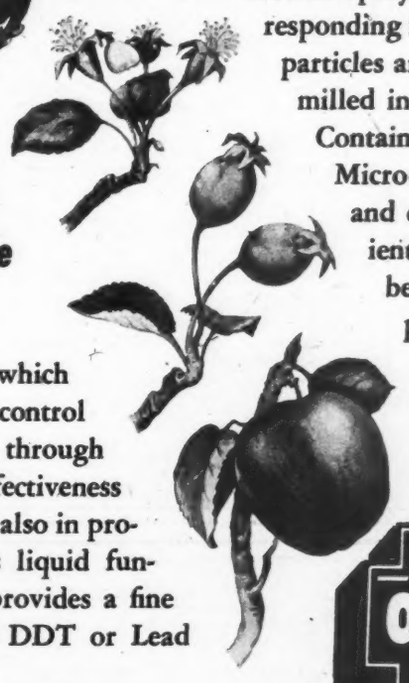
New & Superior Organic Fungicide For Early Protection



Puratized is a new organic fungicide which gives superior results for early season control of apple scab from delayed-dormant through first-cover spray. It has shown high effectiveness in inactivating existing scab lesions and also in protecting foliage against infection. This liquid fungicide mixes readily with water and provides a fine protective film. It is compatible with DDT or Lead Arsenate in combination sprays.

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NICOTINE SULFATE

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Yes, this ALCOA CRYOLITE Insecticide folder, I sent for, just came. See it has a swell dusting and spraying chart, and lists all the pests controlled by ALCOA CRYOLITE.
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Gee, I guess I better send for one of those too, ought to be pretty handy. So long!
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NAME
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CITY
STATE
ALCOA
ALCOA CRYOLITE INSECTICIDE

STATE NEWS

Tukey reported that an extensive research program at MSC will be expanded.

MINNESOTA—Commercial apple growers of Minnesota and western Wisconsin held a joint convention on November 11 and 12 at La Crosse, Wisconsin, to discuss growing and marketing problems. It was the first time that these two groups have cooperated in such a meeting, which was sponsored by the Minnesota Fruit Growers association and the Wisconsin State Horticultural society.

Dr. E. O. Mader, plant pathologist from the University of Minnesota, said that the best way to control apple scab is to forget about a "spray schedule" and start spraying every time it rains during the spore discharge period, applying the spray DURING THE RAIN. At a temperature of 70° the scab organism takes from 8 to 10 hours to penetrate a leaf. The spray must be applied before the scab enters the leaf to obtain effective control, hence the reason for spraying during the rain. A "rain schedule" used in Rice county, Minnesota, this year resulted in excellent control of scab, while nearby trees given the "standard schedule" had plenty of scab. Dr. Mader cautioned against using arsenate of lead during a rain.

George W. Nelson, who operates an orchard at La Crescent, said that a grower should have spray pump capacity of one gallon per minute for each acre of orchard. He added that caterpillar type equipment is necessary for spraying in the rain. Henry Vollenweider, also of La Crescent, stressed the importance of thorough spray coverage, applying the spray until the trees start to drip. He prefers a fog gun at 800 lbs. pressure to a single nozzle gun at 600 lbs. pressure, because the former gives better coverage.

Dr. R. H. Roberts of the University of Wisconsin gave many valuable suggestions to the growers on the subject of keeping trees in good productive condition. He said it is surprising how soon young trees develop branches that quit growing well at the tips. Such branches, he added, should be removed in pruning. Dr. Roberts said that keeping trees in good bearing condition is "just a question of keeping the wood young". Professor C. L. Kuehner, also of the University of Wisconsin, showed interesting lantern slides on pruning and said that biennial bearing varieties like Wealthy and Haralson need "heavier pruning of more of the weak and unproductive wood".—*J. D. Winter, Sec'y, Minn. Fruit Growers' Assoc., Mound.*

LAST CALL FOR APS FRUIT CENTENNIAL

February 17, 18, and 19 are the dates set for the big APS Centennial Fruit Congress in St. Louis, with headquarters in the Jefferson Hotel. The meeting, which will be held in conjunction with meetings of the Illinois and Missouri Horticultural Societies, National Peach Council, American Society for Horticultural Science, and the National Apple Institute, will open Tuesday morning at 9:30, and will continue through Wednesday and Thursday, with a banquet Wednesday evening.

The Fruit Congress is held in commemoration of the 100th birthday of the oldest living agricultural organization in America today—the APS. It is hoped that all interested fruit growers may attend to offer their personal birthday greetings.

NEW YORK—Special tribute was paid to Roy P. McPherson, retiring secretary, at the 93rd annual meeting of the New York State Horticultural Society held at Rochester, N. Y., January 14, 15, and 16. For 27 years he has served as secretary and treasurer of the organization. An easy chair will be presented to him and a book signed by all those present at the banquet.

The resolutions committee—John A. Hall, Lockport; Mark E. Buckman, Sodus; and J. Wessel TenBroeck, Hudson—asked for support of the New York and New England Apple Institute and the state promotional organizations for cherries, peaches, and grapes and requested that funds available under the Hope-Flannagan Act of Congress be matched by the Legislature for marketing research at Cornell University. Studies in better control of diseases and insects by spraying were requested to be continued at Cornell, an adequate supply of nitrogen for production of good fruit is to be assured by the executive committee, and the federal government was asked to resume the compilation of statistics relating to supply and demand.

OREGON, *January 2*—An expanded, statewide fruit and nut improvement project will be launched by the Oregon State College Experiment Station this year.

The project is designed to improve and expand the state fruit and nut crop—valued at more than $90,000,000 in 1946—by introducing, breeding and testing promising new varieties from other states and countries. It will be directed by Dr. Quentin B. Zielinski, associate horticulturist, according to Henry Hartman, head of the horticulture department.

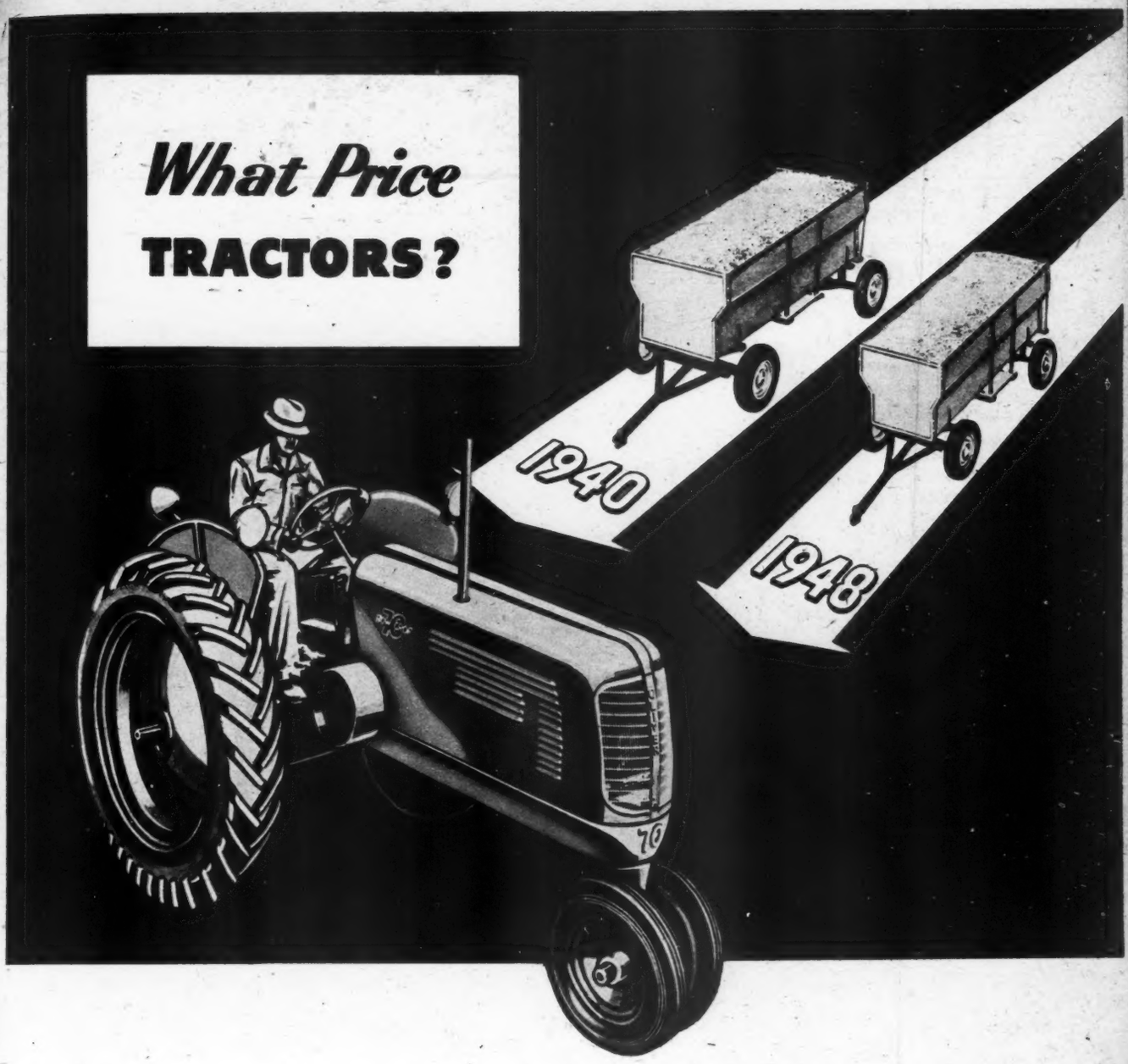
Under project plans, selections from other states will be gathered and studied at the college experiment station. Along with the introduction and testing of new varieties, project workers will initiate breeding experiments once foundation stocks have been established. The breeding program includes only peaches, cherries, pears and small fruits at the present time, but variety collection blocks for apples, plums, apricots and grapes are being maintained and breeding experiments for these fruits will be started in the future when additional personnel may be assigned to this project.

Working with Dr. Zielinski on the improvement project will be Leroy Childs, superintendent of the Hood River branch experiment station; George F. Waldo, pomologist for the Bureau of Plant Industry; and C. A. Boller, Jr., research assistant in the department of horticulture.—*Sam H. Bailey, Oregon State College*

TENNESSEE—Professor G. M. Bentley of Knoxville, Secretary-Treasurer of the Tennessee State Horticultural Society, Inc., for many years, and connected with the Society and its predecessor, the East Tennessee Horticultural Society for the past 42 years, was elected President of the organization at Hotel Patten, Chattanooga, at the 42nd annual meeting, December 10-12, 1947.

G. M. Bentley

Bentley succeeds E. L. Brinkley of Signal Mountain, who in turn was elected Secretary-Treasurer for the coming year. Other officers named were A. C. Jackson of Paris, first Vice-President; Charles Rochelle, Rutherford, Vice-President for West Tennessee; W. E. Stephens, Nashville, Vice-President for Middle Tennessee, and J. R. Stokely, Newport, Vice-President for East Tennessee.—*J. C. McDaniel, State Hort., Nashville.*



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ANSWER: ***Enough to get a good one!***

Oliver Tractors are not the lowest in price. In the face of rising labor and material costs we could not maintain old prices without sacrificing quality. We refused to do that!

However, you can now buy Oliver equipment for *less grain, less beef, less cotton,* less of any farm commodity than at any time in history. Only about three-fourths as much of these farm products are needed to buy a tractor now as were needed in 1940.

We are glad that this is so. We are glad that the income of the American farmer has increased so much relatively. We are glad that our own increases in manufacturing efficiency have enabled us to hold our comparable prices *down*. The Oliver Corporation, 400 West Madison Street, Chicago 6, Illinois.

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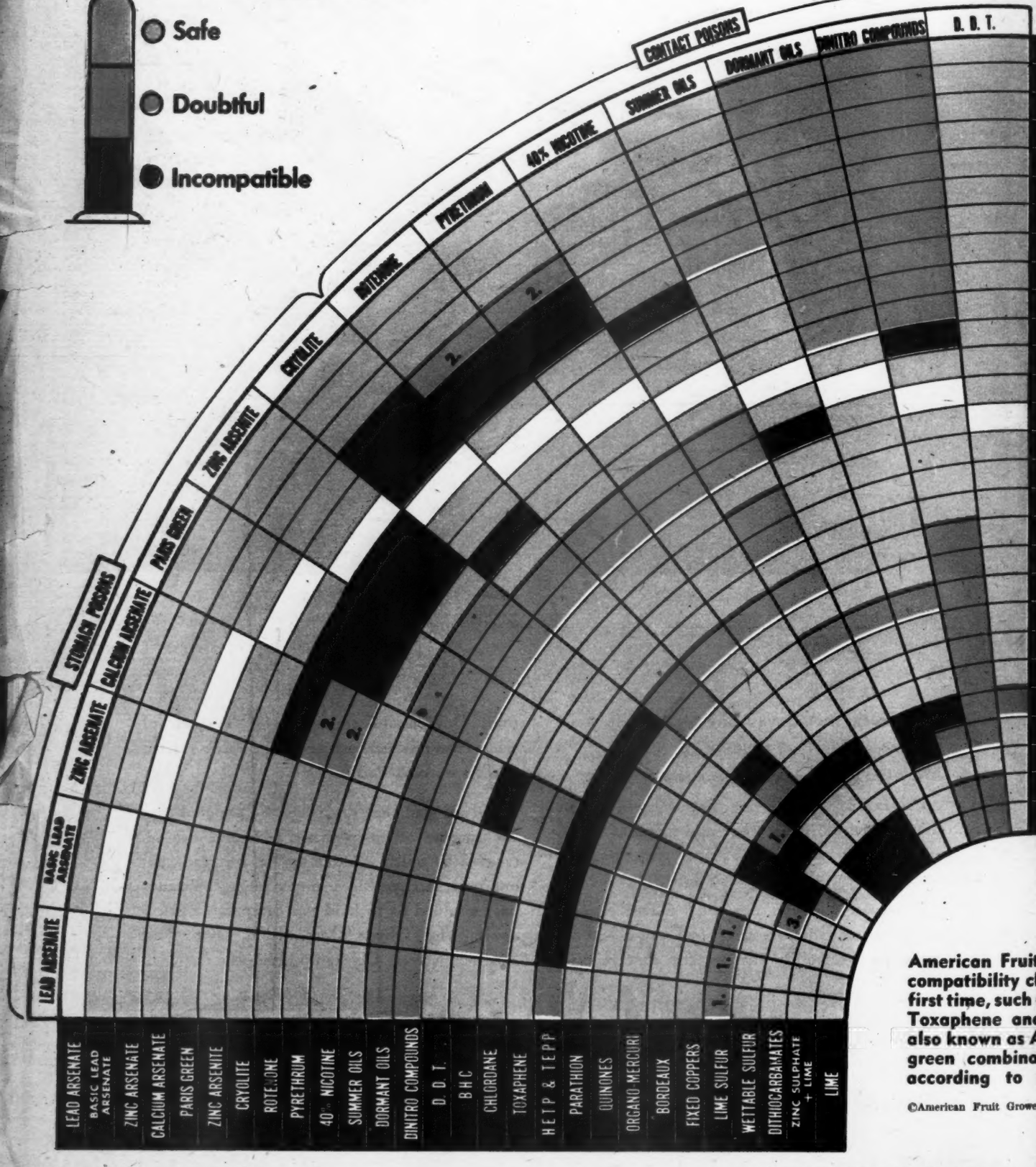
The SPRAY CONTROL SEMAPHORE



American Fruit Grower prese
compatibility chart which inc
first time, such new materials
Toxaphene and Parathion.
also known as AATP, E605 an
green combinations are safe
according to manufacturers

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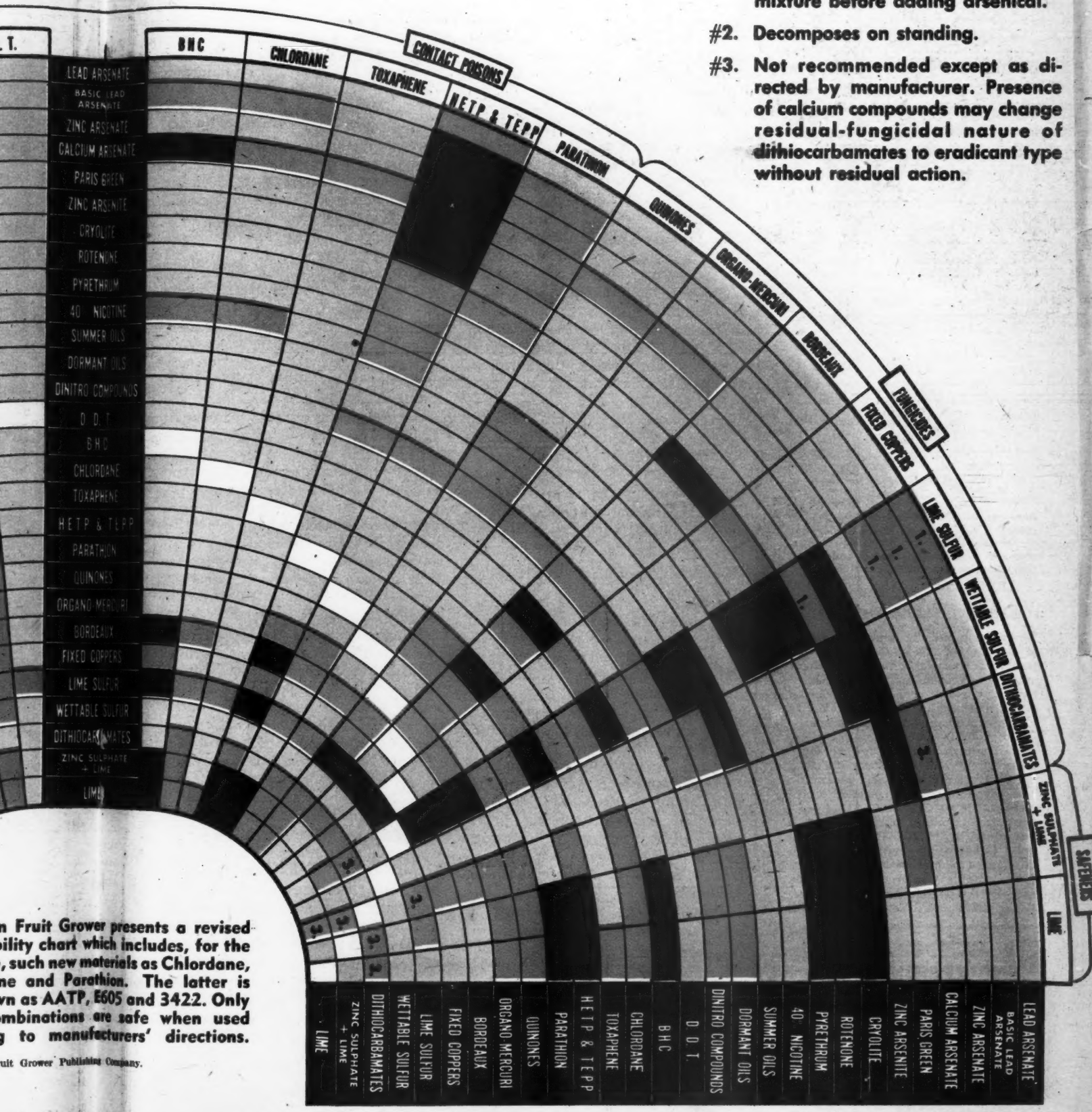
ART FOR INSECTICIDES FUNGICIDES

KEY

#1. Decomposes on standing. Best procedure is to add lime sulfur to spray mixture before adding arsenical.

#2. Decomposes on standing.

#3. Not recommended except as directed by manufacturer. Presence of calcium compounds may change residual-fungicidal nature of dithiocarbamates to eradicant type without residual action.



n Fruit Grower presents a revised ility chart which includes, for the , such new materials as Chlordane, ne and Parathion. The latter is vn as AATP, E605 and 3422. Only mbinations are safe when used g to manufacturers' directions.

uit Grower Publishing Company.

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DOREX ACTIVATED CARBON APPLE STORAGE UNITS

- **Extend storage life**
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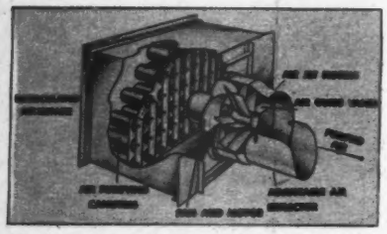
STORE APPLES FOUR TO SIX WEEKS LONGER

Cornell University Agricultural Experiment Station tested Dorex activated carbon air purification equipment in the laboratory and in commercial apple storages for over three years. Results proved that fruit could be kept firm and flavorful four to six weeks longer. Dorex activated carbon units soak up the ethylene gas which quickens ripening, the gases which cause scald, and the "off" odors from packing materials and stored produce that impair taste and flavor. Another advantage is that Dorex units permit access to the storage space at all times for continual storing and removal of fruit.



Dorex self-contained units are designed to meet the requirements and specifications determined by the Cornell research. Portable and adjustable to storage conditions, they may be floor-mounted or suspended from wall or ceiling.

LOW IN COST—EASY TO INSTALL

The average initial Dorex unit cost is 6¢ per bushel (based on storage capacity). Increased profits from a longer marketing season and better quality fruit in the first year alone can often exceed the original investment. Yearly maintenance is about ½¢ per bushel.

Dorex units are shipped complete, ready to install. There are no extra parts to buy, no expensive ducts to erect. Operation is entirely automatic and independent of refrigeration equipment. Little space is needed and practically no attention required. Capacities range up to 20,000 bushels, and units, either singly or in multiple, can be adapted to any size storage or layout.

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POSTWAR PURCHASES OF FRUITS BY CONSUMERS

By M. P. RASMUSSEN and M. R. GODWIN
Cornell University

IN CONNECTION with an experimental study of the prepackaging of fruits and vegetables, data have been obtained from three large retail food stores in Syracuse, N. Y., covering the tonnage of each fruit handled from July, 1945, through June, 1946. These data may be of value to fruit growers, shippers, wholesalers and retailers, who wish to appraise consumer desires and the competition each fruit must currently meet.

These stores sold almost 700,000 pounds of 27 different kinds of fruits from July, 1945, through June, 1946, or an average of about 228,000 pounds per store per year. Five fruits (oranges, grapefruit, apples, peaches and bananas) made up about three-fourths of this tonnage.

Oranges were the most important fruit in the diet of the customers of these food stores, accounting for more than 83,000 pounds annually per store. In other words, for each 100 pounds of fruits sold, 36½ pounds consisted of oranges. No other fruit was half as important as oranges from the point of view of total pounds sold.

Grapefruit ranked second in these Syracuse stores and accounted for almost 13 out of each 100 pounds of fruit sold.

Large quantities of apples are produced within a relatively short haul of Syracuse, and it might be expected that apple sales would outrank any other fruit in these stores. On the contrary, apples ranked third and accounted for only about 10½ out of each 100 pounds of fruit sold.

Despite the fact that fresh peaches are available only about four months of the year, they were fourth in importance in these Syracuse stores, accounting for over 8½ out of each 100 pounds of fruit sold. Bananas were fifth, but it is doubtful whether they had resumed prewar importance during 1945-46, owing to lack of supplies caused by inadequate steamship facilities, etc.

It will probably surprise many to learn that watermelons ranked sixth in importance in Syracuse, accounting for about 5½ out of each 100 pounds of fruit sold. Lemons were next in importance, with about 4½ out of every 100 pounds of fruit sold, followed by pears, cantaloupes and grapes, each of which made up about 4 out of each 100 pounds of fruit handled.

Some idea of how concentrated fruit consumption is, in a relatively small number of fruits, will be obtained when it is realized that 10 fruits (oranges, grapefruit, apples, peaches, bananas, watermelons, lemons, cantaloupes, pears, and grapes) accounted for over 93 out of each 100 pounds of fruit handled. If the next three most important fruits (strawberries, pineapples and tangerines) are included with the above-mentioned 10 fruits, it will be noted that about one-half of the 27 fruits sold in these stores accounted for almost 97 percent of the total fruit tonnage and the other half only about 3 percent.

The manner in which housewives spent their dollars for fruit did not correspond exactly with the importance of each fruit from the point of view of quantity purchased. The five fruits (oranges, grapefruit, apples, peaches and bananas), which were sold in largest quantities in these three Syracuse stores, were also the most important from the point of view of dollars spent for each fruit, though not in exactly the same order. Although these five fruits constituted about three-fourths of the tonnage of all fruit sold, they accounted for only about two-thirds of the dollars spent for fruit.

Oranges made up 36½ percent of the total quantity of fruit purchased but took only about 29 cents of each dollar spent for fruit; and grapefruit made up about 13 percent of the total quantity of fruit, but took only 8¾ cents out of each dollar spent for fruit. On the other hand, apples accounted for nearly 14 cents of the fruit dollar, although the quantity purchased amounted to just over 10 percent.

Peaches took slightly more than 9 cents out of each dollar, and bananas about 5¾ cents of each dollar. Strawberries, which ranked eleventh in quantity sold, were in sixth place when it came to absorbing dollars, taking slightly more than a nickel out of each fruit dollar; and watermelons, which ranked sixth in tonnage, were in eleventh place when it came to dollars spent for fruit.

Here again there was a heavy concentration in a relatively small number of fruits. The 10 most important fruits (oranges, apples, peaches, grapefruit, bananas, strawberries, lemons, pears, cantaloupes, and grapes) absorbed almost 88 cents of each fruit dollar. That left only 12 cents to be spent on the remaining 17 fruits which were sold in these stores.

As one retailer phrased it so aptly, "You can't sell it if you haven't got it and can't get it." Part of the difficulty is, of course, due to the season-

(*Continued on page* 55)

Here's how "Deenate" DDT can help

BOOST YOUR PACK OF CLEAN FRUIT

NOT ONE WORMY apple in a day's picking. This is the common result of effective codling moth control with "Deenate" DDT. Du Pont "Deenate" is formulated to give low-cost coverage and lasting insect kill, yet has little effect on the normal functioning of foliage.

Results in 1947 show that DDT scores higher than ever with fruit growers. Not only for codling moth . . . but as an effective control for many major fruit insects.

These reports come from every section of the country. Wherever they originate, Du Pont "Deenate" DDT is outstanding for lasting insect control.

In the East, Middle West and West, apple growers formerly were plagued with codling moth. But where "Deenate" DDT was used this past year, growers "had no codling moth, no yellow leaves, and foliage was vigorous." "Deenate" is equally good against codling moth on pears, other fruits and walnuts.

Growers in all areas report "Deenate" DDT controls thrips, plant bugs, cutworms, shothole borer, leafhoppers and buffalo tree hopper, as well as migrating San Jose and oystershell scale.

Peach growers report DDT stopped three major pests: peach borer, Japanese beetle, and Oriental fruit moth (below). In California, growers find that "Deenate" easily stops peach twig borer.

Pecan and chestnut growers advise that "Deenate" DDT gives complete control of weevil. With DDT, weevil damage in some Georgia plantings dropped from 43% down to 1%.

With small fruits, growers find "Deenate" equally effective for grape berry moth, leafhoppers, raspberry fruit worm, spittle bugs, cranberry fireworm and fruitworm.

These typical results with DDT show some of the values you can get with a "Deenate" spray program. See your local Du Pont technical representative now for details on "Deenate" and other Du Pont products. Or write to the Du Pont Company, Grasselli Chemicals Department, Wilmington 98, Delaware.

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INSECTICIDES: DEENATE* DDT, LEXONE* Benzene Hexachloride, MARLATE* Methoxychlor, KRENITE* Dinitro Spray, LORO* Contact Insecticide, Cotton Dust No. 10, Cryolite, Lead Arsenate, Calcium Arsenate, Nicotine Products, Lime Sulfur, Phenothiazine—Lead Arsenate Mixture, Paris Green.

FUNGICIDES: ZERLATE*, FERMATE*, and PARZATE* Organic Fungicides, COPPER-A Fixed Copper, SULFORON* and SULFORON-X* Wettable Sulfurs, Sulfur Paste, KRENITE* Dinitro Spray, Bordeaux Mixture.

OTHER MATERIALS: 2,4-D WEED KILLERS, AMMATE* Weed Killer, Du Pont Spreader-Sticker, PARMONE* Pre-Harvest Fruit Drop Inhibitor, Spray Adhesive.

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A wettable powder containing 50% DDT. Used in water suspension sprays. Also kills other fruit insects.

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Contains Benzene Hexachloride

A wettable spray powder containing 12% gamma isomer.

CHIPMAN PARATHION 15%
Controls Aphids and Mites

New, highly toxic insecticide in spray powder form. Can be applied at very low dosages.

HI-TEST LEAD ARSENATE
Controls Many Fruit Insects

Extremely pure form of di-ortho lead arsenate. Offers unequaled guaranteed chemical content as assurance of greater safety and high killing power.

BERAKO — ROTENONE SPRAY
Controls Cherry Fruit Fly

A water miscible spray containing 2½% *pure* rotenone. Also used for green peach aphids and certain other insects.

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PARATHION AND CHLORDANE

(*Continued from page* 19)

now it looks good as a spray for pear psylla, and it may have a place in the control of orchard mites.

A new group of compounds—the organic phosphates—began to appear a year or so ago. The first of these was hexaethyl tetraphosphate, which was developed in Germany during the war. It is very effective against many kinds of aphids and against mites in the active stages. It doesn't kill many of the eggs of mites and doesn't last long enough on the leaves to affect the mites that hatch after the spray is put on, so repeated applications are necessary. When put on with conventional sprayers, and also as a concentrated spray with blower equipment, fog machine, or plane, this product has caused considerable injury to the foliage of pear and peach. A closely related material is tetraethyl pyrophosphate, which behaves in somewhat the same manner. In fact, these materials have been something of a puzzle to chemists, and what was first thought to be one compound has sometimes turned out to be partly the other.

The latest and most interesting member of this phosphate family is parathion. This is a common name adopted to designate a compound known to the chemists as O,O-diethyl O-p-nitrophenyl thiophosphate. No wonder a common name had to be coined! During the 1947 season this compound was known as A.A.T. P. and under two different code numbers, 3422 and E605.

Parathion seems to be very effective in the control of a number of different pests. It may be the best solution yet of the mite problem. A strength as low as ¼ to ½ pound per 100 gallons of a mixture containing 15 percent of parathion has killed about all mites on the trees when it was put on and kept the mites from increasing for a month afterwards. It seems to be an effective summer spray for the pear psylla. There have also been several reports of good control of codling moth from the use of parathion at somewhat stronger strengths than used for mites. In cage tests against the plum curculio this material has killed all the insects much faster than lead arsenate and the other newer materials. No foliage injury has developed in the work so far, which hasn't been quite a full season. Although the results with parathion during 1947 were outstanding, it is best to withhold judgment until we have had more experience with it.

These phosphorous compounds are very poisonous to human beings. In some cases the hexaethyl tetraphosphate has caused difficulty in breathing, a contraction of the pupils of the eye, and difficulty in seeing. These effects seem to wear off after a few days. Parathion is also known to be poisonous to human beings. Until it is more definitely known just what precautions are necessary, all spray operators should use every possible precaution. In fact, all of the newer materials should be handled with the greatest respect. Xanthone, used in a limited way without bad effects for a number of years, recently seems to have caused a number of cases of dermatitis (skin inflammation).

The probable status of residues of some of the new materials on harvested fruit is yet unknown. The tetra- and pyro-phosphates mentioned are probably safe from this standpoint, since rains wash them off readily, and they could be easily removed with water if necessary. Less is known about the possible residue hazard involved in the use of parathion.

This article has included the new materials that appear to be of most interest to fruit growers just now. Many other products are in the offing and may find places in the orchard insect control program, at least for special purposes. Gone are the days when orchard insecticides of all kinds could be counted on the fingers of one hand. New materials will continue to come into the field and will displace older ones, at least in part, only to be replaced later by still better products for controlling certain pests. Stability in the orchard insecticide field is not in sight.

HANDY ANDY

Designed and built by R. C. Wallace of Placerville, El Dorado County, California, this spray gun mounted on the front of a tractor is capable of putting out 800 to 1000 gallons of spray an hour on normal size trees. Eliminating the work of two men and doubling the output of spray, the gun is controlled from the driver's seat. The cost of building this gun is approximately $35. A similar device has been invented by P. C. Van Rensselaer of Port Clinton, Ohio.

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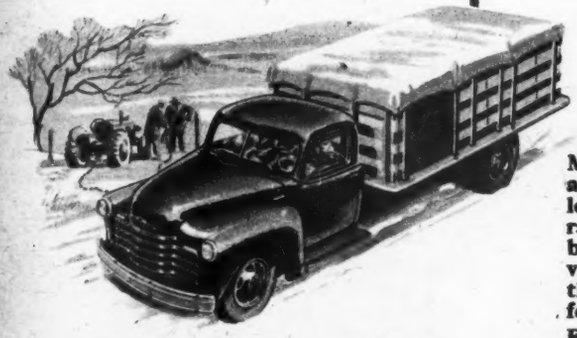
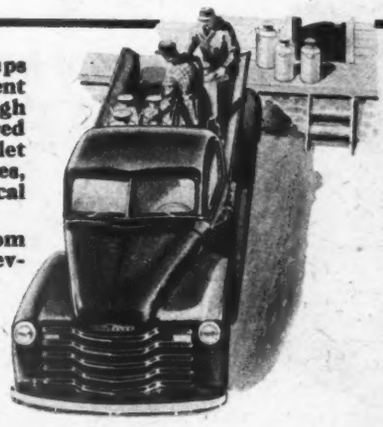
Here, too, are new, stronger frames, longer wheelbases for better load distribution, and hydraulic truck brakes, exclusively designed for greater brake-lining contact.



The cab that "breathes" almost literally "inhales" *fresh* air (heated in cold weather!) and "exhales" *used* air!* It's Flexi-Mounted, cushioned on rubber, with fully adjustable seats, 12 inches more foot room and eight inches more seating space. There's 22% greater visibility, too, and there's even more in the cabs with the new rear-corner windows!



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WETTABLE

This ORTHO Benzene Hexachloride formulation has shown itself to be an excellent control of plum curculio on peaches, apples and plums.

GAMTOX will give first rate results where aphids and tent caterpillars infest the apple orchard.

As a control of wireworms, grasshoppers and crickets GAMTOX is highly effective.

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The isomer ingredients in GAMTOX are well refined. The toxicity to pests is fully retained. The residual odor is reduced.

The outstanding new ORTHO insecticide...

VAPOPHOS
WETTABLE

. . . a contact poison with residual toxicity. Kills red spider mites, hatching mite eggs, most aphids and hatching aphid eggs, mealybugs and certain scale insects.

Much can be achieved by the newer organic pest controls. Their time and place in your program calls for the technical assistance of your ORTHO fieldman.

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THE BEST FROM YOUR SPRAY RIG

(*Continued from page 29*)

ure that a 100 pound drop in pressure, i.e., 500 to 400 with number 12 disc, will reduce the capacity of that disc by two gallons per minute or approximately a 15 percent reduction.

In general, only one sprayman should be used on any rig up to 35 gallon-per-minute capacity. One man can handle that much capacity and do a good day's work. There may be exceptions, however, where large trees will necessitate two men on the same side of a rig of more than 30 gallons per minute, one man doing tops and the other bottoms. Often, in this case, the tractor driver can do the bottoms. Also, in small trees, two men can often work in opposite directions, doing the equivalent of a complete row in one trip through. But for most spraying, one man should handle up to 35 g.p.m. While on the subject of fixed booms, it might be worthwhile mentioning that they should be limited to rigs of more than 45 g.p.m. capacity for reasons too lengthy to describe at this time.

Every fruit grower using a conventional high pressure hydraulic rig of more than 15 g.p.m. capacity should have at least two types of gun equipment: 1. a single gun; 2. a four-, six- or eight-nozzle broom. A grower may want both a six- and eight-, or more, nozzle broom with rig capacities of more than 35 g.p.m.

Above all, growers should adapt their gun type daily, or even hourly, to weather conditions existing when it is necessary to spray. A single gun with a given capacity disc will enable a sprayman to do a reasonable job of covering in pretty windy conditions. It is foolish to try to do a good cover job on average-sized trees with an eight-nozzle broom of less than 30 g.p.m. capacity with much wind blowing, and even worse to resort to one-side (windward) spraying because of wind conditions. Put on a single gun with appropriate capacity disc, and you will generally have complete control of the situation.

In general, a single-nozzle gun with appropriate disc size will handle just as much spray as a six-, eight-, 12-, or greater, nozzle broom. Under good spraying conditions a broom covers more easily and perhaps more efficiently, but do not let a "broom cover" fool you. A broom has no advantage over a single gun in causing less tree or fruit spray injury, provided the single gun is used with common sense.

In general, nothing but a single gun should be used on pumps of less than 15-gallon capacity; and a single gun,

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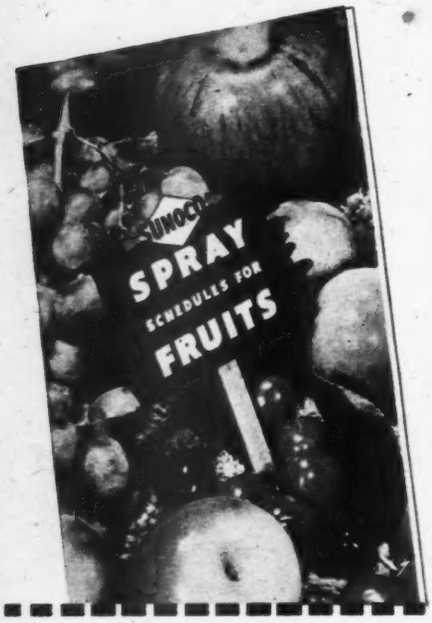
Sunoco's compact booklet of spray schedules for apples, cherries, peaches, pears, plums, prunes, grapes

Sunoco's 20-page illustrated booklet of spray schedules for fruits is a handy reference that has been used by leading fruitgrowers for years. It shows the types of spray to use on each fruit to control various pests, and when to use them.

Sunoco Emulsifying Spray Oil is an outstanding dormant and delayed-dormant spray that has been in use for well over 25 years. It helps to control aphids, codling moths, bud moths, and leaf roller, as well as insects such as San Jose scale and oyster-shell scale. By controlling pests with an oil spray in winter and early spring, you reduce the number of pests you have to contend with later.

Sunoco Emulsifying Spray Oil is easy to use. Just mix it with water and it stays mixed—ready to use. Fill out and mail the coupon below for your free copy of the booklet "Sunoco Spray Schedules for Fruits."



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THE BEST FROM YOUR SPRAY RIG

or up to a three- or four-nozzle broom on rigs between 15- and 30-gallon capacity. For more than 30-gallon capacity, a single gun or six-, eight-, or higher, number of nozzles may be used under fair to good spraying conditions.

Table I, on page 29, should be helpful in adapting the right size disc to your spray pump. The following notes on Table I should be observed:

1. Most manufacturers' nozzle capacity charts agree with this table within practical limit; therefore, this table can be applied to most makes of guns and brooms.

2. For single guns, average discharge figures indicated may be too large to allow the gun to operate within pressure limitations when wide open. It is advisable to select one size lower or obtain a disc size chart from your gun manufacturer.

3. Several manufacturers do not recommend that high capacities be put through certain types of their gun equipment; i.e., one company limits its old-type turn-handle single gun to Number 9 disc., maximum of eight g.p.m. at 500 pounds, whereas it allows for maximum discharge on the trigger power gun of 27 g.p.m. with Number 14 disc at 800 pounds pressure. Most manufacturers have similar maximum-minimum capacity standards for their single-, as well as multiple-, nozzle gun equipment. The only thing for a grower to do is to be sure to obtain a gun or broom that is theoretically designed to handle his pump capacity, and put in appropriate discs.

4. Growers should obtain a range of disc sizes near the appropriate size, also obtain two or three of each of the nearest sizes. The hole sizes of discs become larger with wear and

(*Continued on page* 63)

TABLE II

FRICTION LOSS IN HOSE AT DIFFERENT RATES OF FLOW

Flow in Gallons per minute at 600 lbs. pressure	Pressure loss in pounds per sq. in., for 50-ft. length of hose with fittings		
	Hose: ⅜ in.	½ in.	¾ in.
5	90	18	
6	130	25	
7	175	35	
8	225	45	
9	275	55	
10	325	65	
15		125	20
20		250	40
25			60
30			85
35			125
40			150
45			185
50			240

TABLE III

NUMBER OF TREES PASSED PER MINUTE

Gallon-per-minute capacity of spray pump (or discharge from nozzle on one side of rig) divided by number of trees passed in one minute, equals gallons of spray solution available per one-half tree when spraying without stopping at each.

Speeds in MPH	Feet Per Minute Traveled	Trees Passed Per Minute at Various Tree Spacings					
		16'	20'	25'	30'	35'	40'
1.0	88	5.5	4.4	3.5	2.9	2.5	2.2
1.5	132	8.3	6.6	5.3	4.4	3.8	3.3
2.0	176	11.0	8.8	7.0	5.9	5.0	4.4
2.5	220	13.8	11.0	8.8	7.3	6.3	5.5

TABLE IV

APPROXIMATE NUMBER OF GALLONS OF SPRAY MATERIALS REQUIRED FOR ONE APPLICATION (AVERAGE) PER TREE

Age of Tree	Apple Gals. per Tree	Peach
2-3	.5	.7
5	1.5	3.0
10	6.0	5.4
12	8.0	
15-20	10-16	
21-35	16-30	

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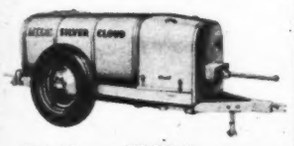
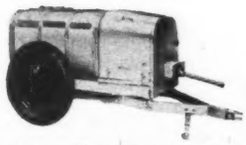

50 & 35 gpm; 600-800 lbs. pressure

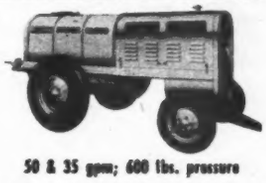

20 & 13 gpm; 600-800 lbs. pressure

7 gpm; 300 lbs. pressure

50 & 35 gpm; 600 lbs. pressure

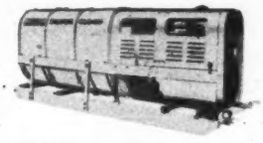
20 & 13 gpm; 600 lbs. pressure

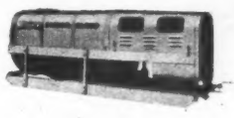
50 gpm; 70 lbs. pressure

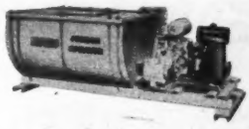

50 & 35 gpm; 600 lbs. pressure

20 & 13 gpm; 600 lbs. pressure

7 gpm; 300 lbs. pressure


50 & 35 gpm; 600 lbs. pressure


20 & 13 gpm; 600 lbs. pressure


7 gpm; 300 lbs. pressure

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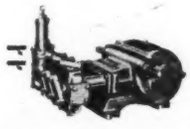
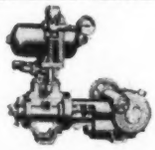
Perfect Spray Power Gun

Junior Power Spray Gun

Silver Spray Power Gun


50 & 35 gpm; 800 lbs. pressure

20 & 13 gpm; 800 lbs. pressure


7 gpm; 300 lbs. pressure

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(Micronized wettable powder containing 50% DDT)

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NUT GROWERS NEWS

Persian Walnuts in the East

THE EAST WILL PROBABLY never compete seriously with the Pacific Coast states in commercial Persian (English) walnut production, but, from among the "Carpathian" and other hardy types now under test, many of us can have Persian walnut trees on our home ground to provide beauty as well as high quality nuts.

Climatic conditions in the Lake States, New England and southern Canada (and in the Cotton States, for that matter) do not favor the *Juglans regia* varieties largely grown in the far west, whose ancestors were the walnuts of southern France and other Mediterranean areas. Much more promising in our eastern regions are various seedlings and varieties of the same species brought back in prewar years by a Canadian missionary from the cold Carpathian mountains of Poland. The Reverend P. C. Crath, some of whose expeditions were financed in part by the Wisconsin State Horticultural Society, collected nuts and scions which have now resulted in fruiting "Carpathian" walnut trees scattered from New Hampshire to Montana and Tennessee. As was to be expected, these have given varying results over this wide territory, and different seedlings in the same planting have had different degrees of success.

In the 1947 Report of the Northern Nut Growers Association (publication scheduled for December), L. F. Latimer, assistant horticulturist, University of New Hampshire, writes: "These walnuts have not been tested long enough to warrant any conclusion as to their promise for New Hampshire; one difficulty will probably be in the fact that the nuts of some do not ripen properly under our cool, short summer conditions." But Matthew Lahti, at a favorable growing site on the shore of Lake Winnipesaukee in that state, had fine Persian walnuts on some of his trees in 1947. And at Ithaca, New York, where spring was delayed and fall freezes began on September 22, 1947, S. H. Graham reports that Persian walnuts ripened their nuts while black walnuts were poorly filled.

Wherever these walnuts are grown, informed planters agree on the desirability of selecting sites with as good air drainage as possible to reduce the damage that spring frosts and freezes cause to blossoms and young branches. Sites similar to those which suit peaches or sweet cherries should be chosen. Even as far south as Tennessee, growth and productivity of many "Carpathian" walnut seedlings have been hampered by cold injury in the spring.

The accompanying photograph shows one of the more successful trees among the Crath seedlings, and the largest of those observed by the writer. It grew from seed planted at Murfreesboro, Tennessee, about 1934, and when photographed in 1947 bore over two gallons of walnuts of good size and quality. The size of its crops is expected to be increased considerably when younger trees in the same planting commence blooming and provide it with cross-pollination.

In most northern states, the butternut curculio has been a chief insect pest on Persian walnuts and the heartnut type of Japanese walnut, as well as its native host species. Leafhoppers have damaged Persian walnuts in several states and Ontario. Cryolite has given good control of curculios in some tests, while DDT appears to be effective against both butternut curculio and the leafhoppers. Also promising for control of these pests are the new "phosphate" synthetic insecticides including "TEP" and others.

—J. C. McDaniel, Sec'y, Northern Nut Growers Assn., Inc., c/o Tenn. Dept. of Agriculture, Nashville 3, Tenn.

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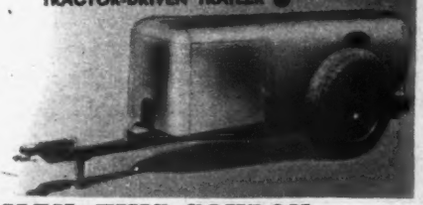

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NEW PESTS FOLLOW DDT IN VINEYARDS

(*Continued from page 24*)

grapevine aphid, grape phylloxera, and several gall forming insects.

There are several reasons why these new pests have become damaging since the old lead arsenate program was abandoned. DDT is specific in its action: it is deadly to certain insects and harmless to others. Although lead arsenate has not been effective as a complete control of berry worms, it undoubtedly helped reduce the numbers of other insects feeding on fruit and foliage not usually considered grape pests. The former use of nicotine sulfate was responsible for checking other pests than the grape leafhopper. A final and perhaps the most important reason for the build-up of some pests is that DDT has killed their natural parasites and predators.

Several species of mites of the genus *Tetranychus* were first observed in 1946. During the season of 1947 their numbers increased to the extent that serious damage was inflicted on vineyards of the Delaware grape. More than 200 mites were counted on each of many leaves. Their feeding by sucking plant juices had caused large areas of vines to become brown late in August and September, and the crop of grapes did not ripen properly. At the present at least, these mites appear to be a pest of varieties with thin leaves such as the Delaware. They have been observed on Concord foliage but have not increased so rapidly in numbers.

The European red mite *(Paratetranychus pilosus)* was observed on grape foliage in 1946 and 1947 but has not increased to the proportions occurring on apple. However, leaves did turn yellow because of feeding by mites.

The European fruit lecanium *(Lecanium corni)* is a scale insect found on the canes and young trunks of vines. The adult scales look like turtle shells and are about one-eighth of an inch in length. These are generally distributed in certain vineyards but apparently are not sufficiently numerous to cause damage.

The red-banded leaf-roller *(Argyrotaenia velutinana)* feeds on a number of plants including apple, plum, cherry, ornamentals, weeds, and truck crops. The use of DDT has greatly favored the increase of this insect and special control measures will be needed to check it. The adults, which slightly resemble moths of the grape berry worm in shape and coloration, have been collected in vineyards for many years. Damage by leaf-roller larvae has undoubtedly been confused with that of the grape berry worm. Up to three generations may occur in a season. Early worms cause webbing of the flower clusters and clusters of young berries. It is characteristic of later larvae to fasten several berries together with webbing and feed within this area of slight protection.

The grape mealy bug *(Pseudococcus maritimus)* feeds by sucking juices from the tender canes, foliage, and clusters. However, the commercial damage is caused by the large amounts of sticky honeydew excreted in the course of feeding. This honeydew on the clusters accumulates dirt and the cast-off skins of the mealy bugs and later gives rise to a sort of sooty fungus growth. In some severe cases of infestation, parts of the clusters become dead and berries shrivel. In any case grapes with mealy bugs are unsightly and unsaleable as table grapes. This insect is sensitive to light and thus infests vines with dense foliage.

The grapevine aphid *(Aphis illinoisensis)* is a tiny, dark brown sucking insect often found clustered on the young shoots and leaves of the terminal growth during the summer. They are conspicuous but seldom do commercial damage except when very numerous and then may feed on clusters. They have become more abundant in vineyards sprayed with DDT but they have not as yet become a serious pest.

The grape phylloxera *(Phylloxera vitifoliae)* is a sucking insect attacking vine roots and leaves, and has a complicated life history. It is not an important pest of vines in eastern America because the vine roots are fairly resistant to its attacks. The phase of the insect living on leaves forms small galls on the undersides that resemble warts and are frequently numerous enough to dwarf and deform the leaves. In a few vineyards these leaf galls have become numerous following DDT spray programs. It is possible the sprays have killed the normal parasites and predators and the phylloxera have increased. Phylloxera has been the most formidable pest of vineyards in California and Europe and, although grape varieties of eastern United States have a degree of resistance, it could become commercially damaging if destruction of the natural parasites and predators continues.

Several other insects form galls on leaves, tendrils, shoots, and clusters of the grape. They are conspicuous but interfere little with the functions of the vine. They have become more abundant in a few places receiving DDT sprays but at the present time offer no problem requiring control measures.

(*Continued on page 57*)

Snug little aphis, asleep on a bough,
Dreamed it was time to awake for his chow,

His dreams interrupted by oil on his bed,
He'll ne'er do his eating 'cause now he is dead.

For positive control of Aphis, Red Mites, Scale Insects ... use Standard Aphid Oil

Whether you secure a healthy profit or a poor return on your apple crop can depend on your success in warding off rosy aphis and red mite attack. You can secure the protection you need by using Standard Aphid Oil as your dormant spray. By the same means you can keep out of your orchard such pests as San Jose scale and scurfy scale.

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No Expensive Compressor or extra Motor Needed

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The famous PowerAire wYe Compressor—attached in less than 5 minutes—furnishes enough air pressure to operate even two pruners at same time.

Simple—easy to operate—made of aluminum so it weighs only 8½ lbs. Hook head over branch, press button on handle, cutting knife quickly cuts clean. Has closest cutting head yet designed—cuts branches up to 1" thick.

Suitable for pruning from ground or elevated platform to reach top branches. Especially adapted to topping or fanning trees in crowded orchards, as well as pruning.

Saves time—uses less labor, cuts operator fatigue. Increases efficiency of available labor. Saves up to 50% of normal pruning costs.

PowerAire Compressor can also be used with low-cost attachments for spraying paint, insecticides, chemicals. Thousands of PowerAire units in use.

Pruner available in 2 sizes—5 ft. and 10 ft. long—either size for immediate delivery with or without wYe Compressor. Special introductory price to orchard men on Pruner only—$45.00.

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APS HISTORY OF HORTICULTURE

OLD MAINE APPLES

By J. H. WARING, *University of Maine*

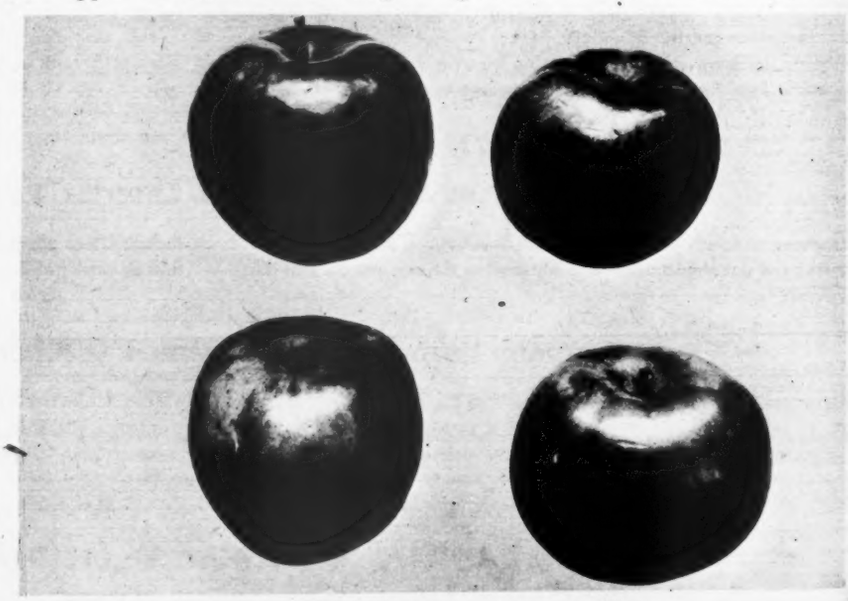
"THE YEAR IS DYING in the night; ring out, wild bells, and let him die." These words of Tennyson express well the principle that doubtless should be applied to the passing of many apple varieties. They were considered good in their time but must yield now to more excellent varieties. It is more than their just due, though, that the better of these veterans of the orchard be singled out for obituary attention.

As orcharding developed in Maine, many local selections were given variety names and were disseminated more or less but failed ever to make "the big time." One such variety, that appears to have escaped all writers, came to light in 1947. Mr. Howard M. Irish of Buckfield sent specimens to the University with this explanation: "The Fremont apple originated with my great grandfather, Hopsteil Bisbee, in Hartford over 100 years ago and has been raised locally since in Hartford and Sumner. It was named after the famous explorer of the West of that day." The fruit seen was quite suggestive of the Aport group, and particularly of Bietigheimer.

Ragan's 1909 revision of fruits recommended by the APS included four apple varieties of Maine origin: Cole Quince, Dudley, Rolfe, and Starkey. In presenting a brief account of these, free use is made of the unpublished thesis of F. C. Bradford, "Apple Varieties in Maine," 1911. Certain first-hand experience and conjecture have been added.

Cole Quince originated about 1833 at Cornish on the farm of one Captain Henry Cole. The fruit is (or was) large, oblate conic, ribbed, bright yellow, sometimes with brownish blush. The horticulturists Beach, Cole, and Downing described it. Its season in Maine ranged from late July through September. It has well-nigh disappeared, but in 1940 a New Hampshire collector obtained budwood said to be of Cole Quince from Charles Rand of Wilton, Franklin County, Maine. The identity would bear checking because Bradford reported another apple, Russell, grown locally in Franklin County as Cole Quince.

Dudley originated as a seedling of Duchess of Oldenburg about 1877 on the farm of J. W. Dudley, Castle Hill, Aroostook County. Chase Brothers' Nursery began to distribute it in 1890. For a time nurserymen sold it as North Star, and some fruit of Dudley still appears on the Bangor market as North Star. Dudley is very little grown in its native state now; it is



Above—(left) Dudley (right) Jewett Red
Below—(left) Rolfe (right) Winthrop Greening

more prominent in Quebec and Wisconsin and has received attention in Iowa as a possible intermediate-stock variety.

Munson described the fruit as large, roundish oblong, greenish yellow, washed and splashed with crimson; good to very good; September to January—later in Aroostook County. Beach described the variety. The writer's first impression, gained from undersized fruit sent in from Caribou, was decidedly unfavorable. Trees later propagated and now in early bearing under good culture produce apples of good size and appearance.

There are two accounts of the origin of Rolfe, differing in the slight particular as to the town of origin, whether Guilford or Abbot, adjoining towns in Piscataquis County. The time was about 1820. It began to attract attention about 1870 and was disseminated throughout Maine and to other states. Although Beach described it also, a few notes are here given from Munson's description: "Fruit medium to large, oblate, often angular, yellowish, shaded and striped with red. Good to very good. November to January." Rolfe has become a minor variety at home but is decidedly not extinct. It is a favorite home apple with a few of the older orchardists. One such is Mr. Lyman K. Lee of Dover-Foxcroft, close to the place of origin. Budwood is readily obtainable from several sources.

Starkey, the fourth native variety for this discussion, may indeed have become extinct. Current efforts in several counties have failed to discover an existing tree, which is unfortunate in view of a definite desire to reappraise it.

Starkey originated in Vassalboro on the farm of Moses Starkey before 1800 and was thought to be a seedling of Ribston. It was reported in 1872 as commanding better-than-average prices in Kennebec County markets because it was esteemed as a dessert variety. It was also featured in exports to Liverpool. From Munson's description we find that the fruit was medium in size, oblate but slightly conical in form, regular; skin pale yellow, shaded, striped and splashed with light and dark red, and having numerous grayish dots. The flesh was whitish, tender, juicy, mildly sub-acid, and very good. The season was from October or November to January. A present member of the faculty of the College of Agriculture recalls having had autumn employment about the year 1910 picking Starkey apples from a commercial orchard in Kennebec County. He thinks that it would not rate well with the varieties of today.

POSTWAR PURCHASES

(*Continued from page* 42)

ableness of many fruits. If all of the 27 fruits were available in substantial quantities throughout the year, the story of fruit consumption might be very different. Some products, such as blueberries, currants, raspberries, and casaba melons, were carried only during one month of the year. Apples, bananas, lemons and oranges were the only fruits available in these stores every month of the year, while grapefruit was stocked 11 months, pineapples for 9 months, pears for 8 months, and most of the other fruits from 4 to 5 months of the year.

How should one try to obtain the largest share of the consumers' fruit dollar? The answer will vary with the month. Peaches were the most important fruit handled during July, August, and September from the point of view of dollars spent for each fruit; oranges were the most important from October through May; and strawberries and oranges were of about equal importance during June. From November through March oranges, apples and grapefruit were the three most important fruits handled, and they absorbed from about two-thirds to over four-fifths of the fruit dollar.

Some of the more highly seasonal fruits, such as strawberries, pineapples, raspberries, and pears, were much more important from the point of dollar sales than of tonnage handled. Others, like watermelons, contributed more tonnage than dollars.

USE MORE AIR —LESS WATER

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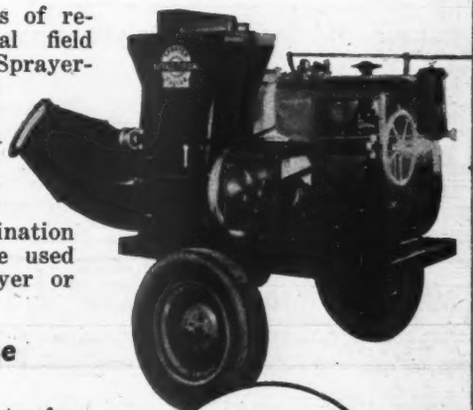

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BUFFALO TURBINE AGRICULTURAL EQUIPMENT CO., Inc. GOWANDA, N. Y.

Manufacturer of the Original Sprayer-Duster

GRASSHOPPERS

(*Continued from page 22*)

than are the larger nymphs and winged forms.

A poison bait is still considered a good means of control under certain conditions. Under other conditions, particularly in orchards, the use of sprays or dusts of one of the newer organic insecticides has given superior results.

Chlordane is recognized as one of the most effective insecticides ever tested against this pest. When used against the first, second and third stages of hopper development, chlordane should be used at the rate of ¾ to 1 pound of actual toxicant per acre. When used against the larger nymphs and adults, the amount should be increased to 1½ pounds per acre. Application should be directed mostly to the ground and cover of the orchard floor. The entire surface and the lower one-quarter of the trees should be treated. Chlordane should not be applied to edible crops within one month of harvest. Most fruit trees are tolerant to chlordane, but since some injury has occurred to plum and prune foliage following early season treatment, orchardists are advised not to use this material on such trees until their tolerance is more clearly established. Under most conditions one properly timed treatment will give a full season of protection. However, if the hatching period is greatly prolonged or if there is extensive migration from untreated to treated areas, a second spray or dust may be desirable.

Benzene hexachloride used at 2 to 3 pounds of a 6 percent gamma isomer per acre has given good control of the smaller nymphs. Larger dosages are required to effect good control of the larger nymphs and adults. The residual effect of benzene hexachloride is not as great as with chlordane. Operators should avoid the application of this material to fruits or other crops within six to eight weeks or longer before harvest, since the odor and taste of the chemical may contaminate the edible portions.

S-C-A-B

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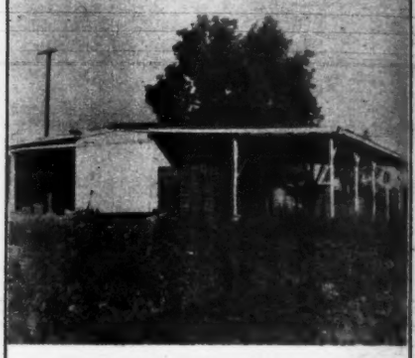


A "retired" refrigerator car, complete except for wheels, is continuing a useful life at the orchard of Clark Basset in La Porte County, Indiana. Open sheds have been constructed on each side of the car where the fruit is sorted and packed. When peaches ripen too fast, the bunkers are filled with ice and the peaches put in the car until they are sold. At other times the car is used for temporary storage, especially for apples.

Parathion, a real newcomer in the field of insect control, has given excellent control of grasshoppers. Because of its "youth," reports of research with this material for hopper control have not yet clearly established its possible commercial usage. Information is continuing to come in, and growers are advised to keep in touch with their source of supply regarding developments and handling hazards of this chemical.

Chlorinated camphene is also effective for controlling grasshoppers. This compound should be applied in a dosage from two to three times that given for chlordane. It is also slower in action as compared with chlordane and benzene hexachloride.

NEW PESTS FOLLOW DDT IN VINEYARDS

(*Continued from page* 52)

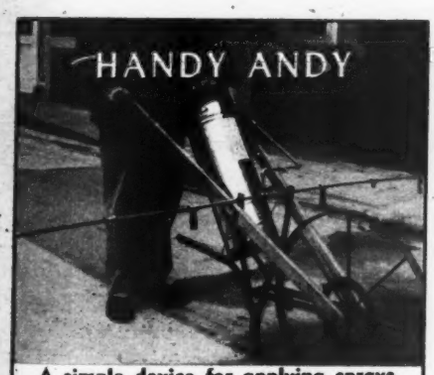
It is not the purpose of this article to discuss controls for all the pests mentioned because continued use of DDT may aggravate the problems or give rise to others. Investigations will probably be undertaken and new recommendations made.

In vineyards where the level of berry worm damage has been reduced to almost nothing, the use of DDT could be discontinued to permit the program to be changed to combat other pests now of greater importance. Such a step may be of benefit where mites are prevalent and thus allow parasites and predators to restore a degree of natural control. Some of the miticide materials being used for the European red mite on apple might be applied on grapes.

An application of lead arsenate should be included in the DDT program if the red-banded leaf-roller threatens. This would also check some other insects feeding on external surfaces of fruit and foliage.

Parasites and predators have been an important factor in checking the European fruit lecanium, grape mealy bug, grapevine aphid, grape phylloxera, and others. DDT has killed many of them, but it is reasonable to expect this natural check could be reestablished if DDT were not used.

DDT has been a potent weapon against the grape berry worm; but when it has done its work, it may well be advisable to return to a spraying program containing lead arsenate, a suitable fungicide, nicotine sulfate, and a summer oil as a sticker-spreader.



A simple device for applying sprays has been constructed by the Michigan State College Horticulture Department. A common 5-gallon hand air compressor sprayer is mounted on a garden cultivator equipped with a boom that is made of ⅛-inch pipe with 4 to 6 fan-type nozzles placed approximately 18 inches apart. By changing the size opening of the spray nozzle, 2,4-D rate of application can be controlled so that it is possible to use as low as 6 gallons per acre of concentrated spray material.

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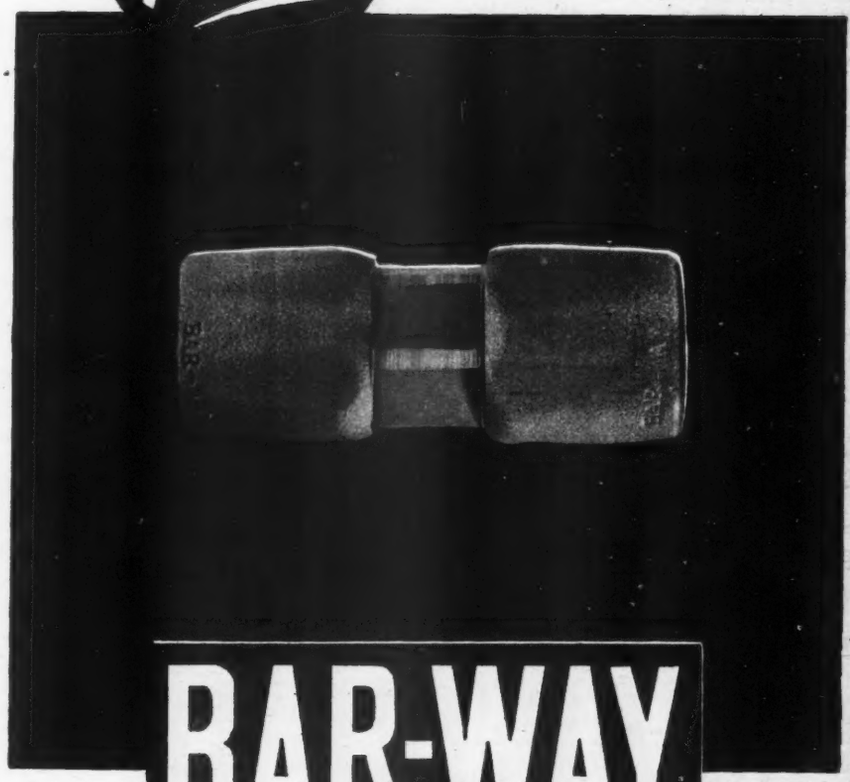

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HIGH PRESSURE SPRAY HOSE COUPLINGS

Used and proved in the field for years; approved by Underwriter's Laboratories, Inc., and the Armed Forces of the U.S. Bar-Ways just won't fail—hose will blow first. Interchangeable and remountable—use over and over again. That's real economy. Attach quickly in the field with simple key wrench—that's real efficiency. For faster work, more economical operation, better work and higher profits, see your supply house today and switch to Bar-Way.

NO OTHER HOSE COUPLING HAS EVER PROVIDED SUCH A COMBINATION OF ADVANTAGES TO SPRAY OPERATORS!

- FULL FLOW . . . no suppression of flow in coupling.
- STREAMLINED . . . free from objectionable projections; nothing to catch or injure.
- INTERNAL EXPANSION . . . no shrinkage of hose at coupling.
- ACCURATELY MACHINED . . . always the same—interchangeable.
- REMOUNTABLE . . . without the purchase of additional parts; use over and over again.

SPECIFICATIONS FOR SPRAY HOSE COUPLINGS

Model	I. D.	O. D.	Thread
No. 132	7/16" — 1/2"	31/32" — 1-1/16"	Garden Hose
No. 136S	3/4" ± 1/32"	1-3/16" to 1-9/32" incl.	1" I.P.S. or Garden Hose
No. 156	3/4" ± 1/32"	1-11/32" ± 1/32"	1" I.P.S. or Garden Hose

Write for our free descriptive circular. If your supply house hasn't yet stocked up on Bar-Ways, send us his name and we'll see that he receives full details from our distributors.

Dependable
CHAMPION
America's Favorite Spark Plug

The American farmer subjects spark plugs to sustained and severe service in all kinds of engines. He insists on dependable ignition and it is significant that dependable Champion—America's Favorite Spark Plug—is the overwhelming favorite of farmers everywhere. Champion Spark Plug Company, Toledo 1, Ohio.

FOLLOW THE EXPERTS

DEMAND DEPENDABLE CHAMPIONS FOR EVERY FARM ENGINE

Listen to CHAMPION ROLL CALL, Harry Wismer's fast sportscast every Friday night, over ABC network

EFFICIENCY IN SPRAYING

(*Continued from page* 21)

screen. They also put arsenate of lead or DDT directly into the tank, keeping the agitator running, without screening it. The important thing is to have a method that will get water and material into the tank in five minutes.

9. Adapt method of spraying to the type of pests to be controlled—This is important in order to control pests with the minimum of labor. Spray only from the tank when apple scab is the one pest to be controlled. This is often the situation in the delayed dormant and pink sprays. Have a platform on the back of the sprayer about one foot from the ground to use when a ground lead is needed. For satisfactory control of red mite, red banded leaf roller on apples, and for leaf spot on cherries, the undersides of the leaves must be covered.

George Wilson, Waterport, N.Y., devised an oscillating broom gun to attach to the side of his sprayer that runs under the trees. The end is carried by a rubber-tired wheel about 8 inches in diameter, on which is a cam shaft to move the guns back and forth.

10. Keep the spray rig going in the early sprays by:—*Keeping apple orchards in sod.* This also aids in obtaining high color on red varieties. *Draining the wet spots with good open ditches or tile.* The open ditches may require some attention after each spray. *Having sprayer mounted on two wheels with tank centered over the axle.* Large size tires should be used. Consider 13x24 or 10x38 the minimum size. Used airplane tires, size 17x16 or larger, could also be used. *Having power that will give the necessary traction.* In hilly areas this may mean caterpillar tractors. In more level areas, rubber-tired tractors with bull dog chains probably will do the job with sprayers that are properly designed. Some growers in Niagara County, N.Y. have fastened steel wheels on the outside of the rubber tires of their tractors. When the rubber tires cut in, the steel lugs take hold. Where rubber-tired tractors or doodlebugs can be used, they greatly reduce the time lost in refilling.

11. Have good roads in orchard—So you can get back and forth rapidly in the orchard, road improvement is necessary.

More value may be obtained from spraying by adhering to several basic principles. Use the cheapest material that will do the job with the least injurious effect on the foliage and fruit. Many new materials, that are usually more expensive, have come on the market recently. Be sure that either better control or few applications justify the use of the more ex-

pensive material. Observe your own orchards and apply only the sprays needed and on time. While prices are high, play safe; the loss from omitting a spray may be much more than the cost of one or two applications. Control pests early. Insects and diseases are like weeds; they can be controlled more easily while young and before they multiply. When rains threaten or when wet trees approach the time when scab infection is expected, cover first the blocks of scab-susceptible varieties such as McIntosh. Be sure to get scab under control early so it will not be necessary to use sulfur in the later sprays. Use a duster when necessary to cover orchards quickly, or when mud makes spraying difficult.

Most spray men are not interested in speeding up the spray operation unless the job can be made easier. Here are some suggestions for accomplishing this objective. Use a spray gun holder; many types are used by growers. One of the simplest is shown in the illustration. It consists of a band iron around the gun rod that is fastened with one bolt to the flattened end of a short piece of ¾-inch rod. The ¾-inch rod sets into ¾-inch pipe. The length of the pipe can be changed for different sized trees, and the gun can be lifted out of the pipe when desired. Have spray nozzles of broom guns at an angle of about 15 degrees from the spray gun rod, so the force of the spray as it leaves the nozzles will support the gun. When the nozzles cannot be turned, bend the gun rod near the nozzles. This reduces the "kick back" and makes the movement of the gun easier. Use a short rod on broom guns if the trees are small or if the branches nearly meet in the middle of the row, and have the holder of the spray gun and the driver change places after each tankful has been applied. One can tell better from the drivers' position whether a thorough job of spraying is being done.

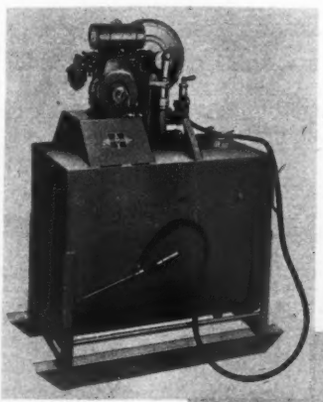
The actual hours of spraying are valuable, and one must make every effort to enable labor to be efficient. Analyze your own situation in the light of the above suggestions so that you can (1) apply more gallons of spray a day, (2) obtain more value from spray applied, and (3) make spraying easier.

Efficient spraying means control of insects and diseases with a minimum of labor.

Kenneth L. Robinson's thesis "Cost and Efficiency in Spraying Apples" has been summarized by Dr. C. G. Garman in a mimeographed report, A.E. 654. Copies may be obtained from Farm Management Extension, Warren Hall, Cornell University, Ithaca, N.Y.—Ed.

BIG NEWS
from HUDSON
New, fully tested and proved line of power sprayers now ready

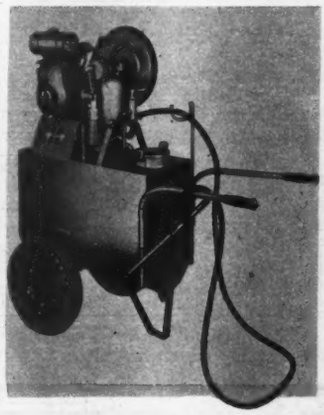
Here they are — the completely new designed Hudson power sprayers. Incorporating all the tested and proved features Hudson has developed in 46 years... including many important new improvements... these new power sprayers assure the best application at lowest labor and maintenance costs. Before you buy *any* power sprayer, see the new Hudson. Compare them feature for feature with any others. Convince yourself that for efficient application, easy operation and trouble-free economical service, Hudson is by far today's best value in power sprayers. Write today for full details.



New Hudson skid-mounted Power Sprayer. Discharge capacity 4 gallons per minute. 100 gallon tank. Also available in 2 gallon per minute capacity with 30 or 50 gallon tank.

New Hudson pneumatic-tire Power Sprayer. Discharge capacity 2 gallons per minute. Available with 30 or 50 gallon tank.

New Hudson pneumatic-tire Power Sprayer with trailer hitch. Discharge capacity 4 gallons per minute. 100 gallon tank.



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Agricultural Spray

Puratized Agricultural Spray is a new, outstanding organic fungicide which offers dependable protection against the ravages of apple scab.

As an early spray recommended through the first cover application, an "ounce" of Puratized protection now — 1 pint to 100 gallons of spray — means a lower cost spray program, greater yields, and a high degree of scab elimination.

Puratized Agricultural Spray is easily handled — simply add contents to spray tank and apply according to instructions.

Available at your local dealer, or write today for complete details.

Manufactured by

GALLOWHUR CHEMICAL CORPORATION

NEW YORK, N. Y.

PLUM CURCULIO

(*Continued from page 23*)

and cultivation may be advisable in some years when curculio infestation has been severe. This last September, all through the Georgia peach belt, post-harvest sprays were the rule rather than the exception.

Need for New Plum Curculio Insecticide

Although arsenate of lead is still the recommended insecticide for curculio control, it has several qualities which make the development of other insecticides for curculio control highly desirable. First, it so burns the trees and foliage, even with the addition of safeners, that it undoubtedly shortens the life of the trees. Second, it does not effectively control curculio when infestation might be classed as medium or above, and for good control, in nearly all cases, must be combined with very strict adherence to the laborious and expensive sanitary practice of picking up drops. Third, the need of the correctives such as lime and zinc sulfate results in clogging of the nozzles and makes the spraying operation even more time consuming and disagreeable than is necessary. Certainly lead arsenate cannot be considered as an ideal insecticide for the plum curculio.

New Insecticides Tested in 1947

Benzene hexachloride: This last season benzene hexachloride was tested at the Georgia Experiment Station on a fairly large scale. Under the prevailing conditions we were able to effect commercial control at rates as low as 1¾ pounds of the 6 percent gamma isomer material. Our intention was to use up to four pounds of 6 percent gamma isomer benzene hexachloride per one hundred gallons of spray, but the material was not available in sufficient quantities during the early part of the spraying season to permit the use of this amount. In fact, the scarcity of material made it necessary to delay one spray to an interval of ten days although preliminary work had indicated that the residual effect of this insecticide only lasted from five to seven days. In spite of this disadvantage of scarcity of material in the early season work, nearly as good commercial control was obtained with benzene hexachloride as with the arsenate of lead sprays. Had this material been available so that we could have increased the dosage and applied it at five to seven day intervals, we feel that benzene hexachloride sprays would probably have proved superior to lead arsenate in controlling curculio, as it appears to

Keep the snow off your walks and drives this winter ... plow, disc, seed, mow and cultivate next spring ... with one simple, economical machine ... the CUNNINGHAM Garden Tractor with its snow plow attachment and complete line of matched implements. Snow plow is fast, easy to handle on snow removal, light bulldozing and feed floor cleaning. Tillage attachments designed for all types of garden tractor work.

SICKLE BAR MOWER

3-foot cut, variable speed ... rubber tires or steel wheels ... free wheeling ... SNOW PLOW ATTACHMENT ... many new features for 1948.

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JAMES CUNNINGHAM, SON & CO.

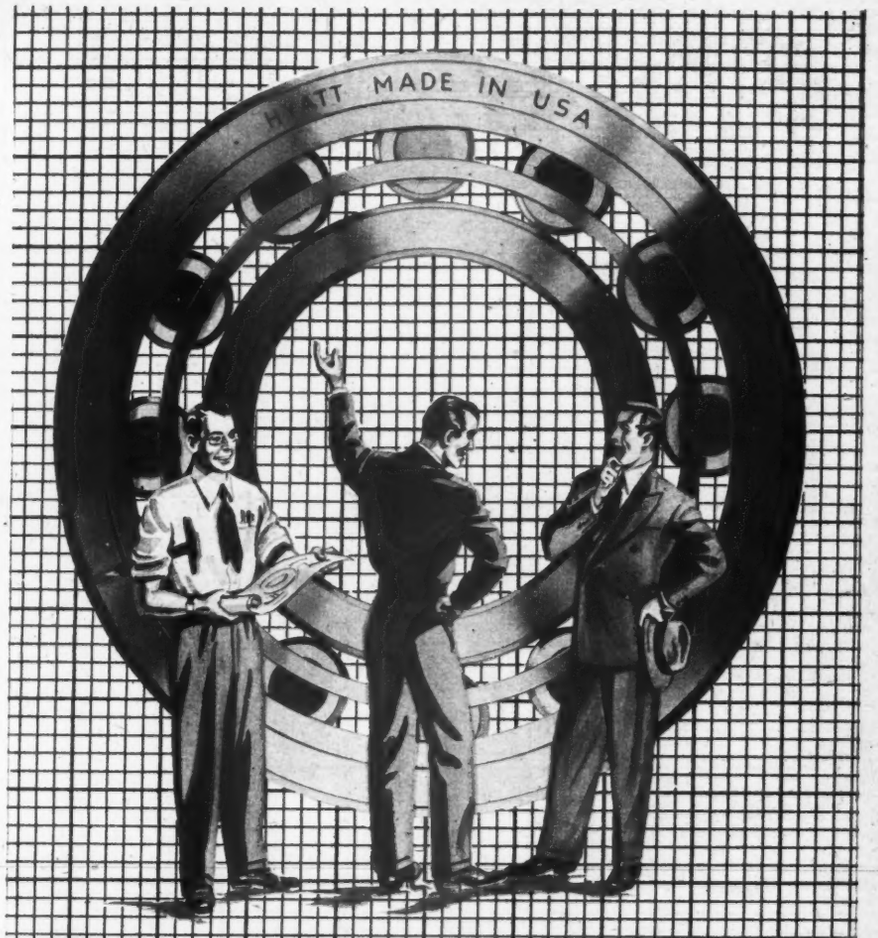
GARDEN TRACTORS MOWERS

Rochester 8, New York

be from results in many other sections of the country.

Unlike lead arsenate, benzene hexachloride does not injure the leaves or tree in any way. No correctives or safeners are needed. In its present form it cannot be used beyond the first cover spray because of the musty odor that it imparts to the fruit. Some manufacturers are already turning out a product that is deodorized so this may not be a problem in the future. The main use of benzene hexachloride at this time would appear to be as a substitute for lead arsenate up through the first cover or 14-day spray, with lead arsenate used in the month before harvest application, in a combination benzene hexachloride-lead arsenate spray program.

Hexaethyl Tetraphosphate: The plum curculio infestation (first generation adults) the second week in July ranged on the average from four to six per tree in many orchards in the middle Georgia peach section. Knowing that one female curculio can produce an average of 50 eggs under orchard conditions, one can appreciate the seriousness of the situation. Most growers had already used five lead arsenate sprays (one more than recommended) and were afraid to use more lead arsenate because of the danger of defoliating the trees. As an emergency measure and against the advice of most research workers, hexaethyl tetraphosphate, a contact insecticide, at the rate of one pint per one hundred gallons of spray was applied starting July 13. All kinds of conventional spray machinery were used in this application over the middle Georgia peach section. Ordinary precautions were used in handling the concentrated material, and, apparently, no individual applying this chemical suffered any ill effects; nevertheless, until more is known about this material, it should be handled with respect and every precaution taken to avoid breathing it. In every case where the spray was thoroughly applied, the curculio population was effectively cut down to the point where it no longer gave serious threat of wormy peaches. The only exceptions appeared to be in orchards so heavy with foliage that the spray failed to penetrate. This is to be expected since the material must contact the insect to cause its death. Hexaethyl tetraphosphate has resulted in some damage to the foliage. The injury appears first as small reddish spots with the center later dropping out leaving rather clean cut holes up to one-eighth inch in diameter. No detectable injury was observed on the fruit after this



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The manufacturer who builds a machine using Hyatt Roller Bearings realizes their advantages for more compact, efficient, economical design.

The dealer who sells the equipment further knows that with Hyatt Roller Bearings "Built In" that better operation and more satisfied customers are the result.

And you the ultimate user are the real beneficiary when the specifications of the equipment you purchase read "Hyatt Equipped."

Hyatt Bearings Division
General Motors Corporation
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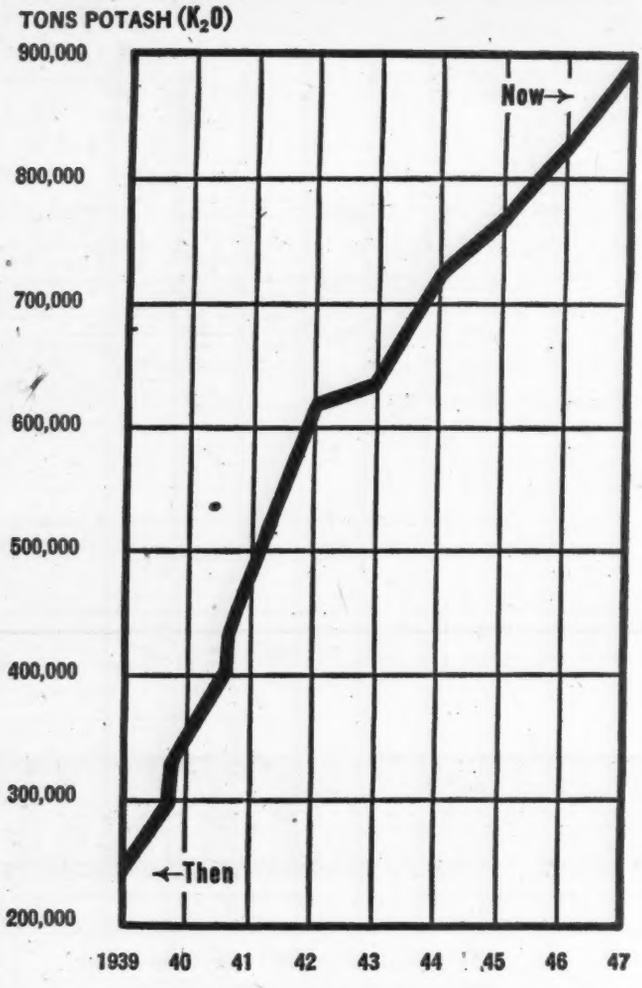
HYATT ROLLER BEARINGS

POTASH FOR AMERICAN FARMS



North American Deliveries of American Potash for Agriculture

The American Potash Industry, to keep American farms operating in high gear, is now producing and delivering for agriculture more than three times as much potash as it did in 1939. (*See chart.*) This record has been made in the face of great man-power, equipment, and shipping difficulties. While you still may not be able to get all of the potash you want to use, every effort is being made to meet the greatly increased demand for this essential plant food.

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American Potash means More Crops

PLUM CURCULIO

chemical was applied.

Experimental work with these insecticides is too preliminary to permit recommendation for use by the peach grower. On the basis of this one year's work, about all that can be said is that they look quite promising.

Other New Insecticides

There are several insecticides other than the two previously mentioned which have been tested somewhat and look as if they might possibly be of value in plum curculio control. Some of these include tetraethyl pyrophosphate, chlordane, chlorinated camphene, and the aryl alkyl thianophosphates. While none of these has been sufficiently tested to warrant a general recommendation, one of the thianophosphates, Parathion, has proved very effective in preliminary trials and will be watched with considerable interest in 1948.

Future Plum Curculio Control

It would appear in the light of the development of these new organic insecticides that the days of using arsenate of lead as a spray for plum curculio are numbered. Its failure to give control of the insect and its injury to the tree and foliage are sufficient reasons for throwing it out of the spray program as soon as something better turns up. Of these numerous new insecticides, there is likely to be one which is superior and more nearly the ideal insecticide for plum curculio control. At the present time the cost of these compounds is high, but once demand is established these insecticides will continue to decline in price and will certainly be competitive in the future.

Another thing that must come is some good method of destruction of the curculio larvae in the May drops. Picking up the May drops is one of the principal items of expense in the operation of the southern peach orchard. Whether this is to be accomplished by some chemical spray, by a type of flame thrower killing by heat, or by some mechanical means of picking up these drops remains to be seen, but come it must. Of course, something still more desirable would be an insecticide sufficiently effective in curculio control so that few if any wormy drops would appear. At least we can report that progress is now being made in plum curculio control after nearly 30 years of almost complete standstill.

Get one of these
2 to 4 Hp.
WISCONSIN
Air-Cooled
ENGINES for your
Farm Power Chores

There are plenty of jobs around the farm or dairy where a dependable, heavy-duty, all-weather Wisconsin Air-Cooled Engine comes in handy. This engine is always ready to go, in any weather, at any time of the year. The high tension weather-sealed magneto is equipped with an *impulse coupling* which guarantees a fat, hot spark for quick easy starting. And being air-cooled, you never have to worry about freeze-ups in cold weather, or dry-ups in hot weather.

Other features of these 4-cycle, single cylinder engines include: concentric float feed carburetor for efficient, economical operation; Timken tapered roller bearings at BOTH ends of the drop-forged, counter balanced crankshaft . . . for smooth, easy running and long-life protection against bearing failure; positive lubrication by means of a pump-circulated constant level splash system; mirror-honed cylinder to reduce friction and provide the best power-seal. Net weight: Model AB (2-3 Hp.) 76 lbs.; Model AK, (3-4 Hp.), 77 lbs.

And remember . . . these are the engines that deliver the "Most Horsepower Hours" of on-the-job service.

Models AB and AK are now *immediately available* through your local authorized Wisconsin Engine dealer. See him right away. And write us for circular illustrating and describing the full line of Wisconsin Air-Cooled Engines, single and 4-cylinder types, 2 to 30 Hp. Address Dept. AFG-2

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World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

THE BEST FROM YOUR SPRAY RIG

(*Continued from page* 48)

may need replacing three to five times a season. To obtain discs, contact your rig dealer or manufacturer or refer to equipment listings in the July "Directory Issue" of AMERICAN FRUIT GROWER. Discs may be drilled at home, but most discs are too hard for home equipment to drill.

Higher pressure results in faster spraying because when an orchardist increases the pressure behind his spray guns from 300 to 400 pounds to 500 or 600 pounds, the work goes faster. This is because the liquid is broken up into many more droplets than before, and the more finely atomized spray gives uniform coverage in less time, without using any more spray liquid.

Using a smaller disc opening does not give finer spray. Decreasing the size of the disc opening in your gun or broom will give you a smaller spraying cone, delivering less liquid with shorter carry, but it will not decrease the size of the spray droplets. High pressure (or wind velocity) is the important factor in getting a finely atomized spray. The higher the pressure, the smaller the droplets of spray liquid.

To get additional distance of carry in spraying, use a larger disc opening in your gun or broom. While increased pressure does help to get distance (up to about 600 pounds) the most important factor is volume. Therefore, a larger disc opening—not extremely high pressure—gives the desired results. Pressure higher than 600 pounds breaks up the solution into smaller droplets which tend to travel a shorter distance. Extremely high pressures actually cut down the distance of carry.

CALENDAR OF COMING MEETINGS AND EXHIBITS

Feb. 4-6—West Virginia State Horticultural Society annual convention, Martinsburg.—Carroll R. Miller, Sec'y.

Feb. 12—Vermont State Horticultural Society meeting, Municipal Auditorium, Barre.—Charles H. Blasberg, Sec'y.

Feb. 12-13—Idaho State Horticultural Society annual meeting, Boise Hotel, Boise. —A. Harold Davidson, Sec'y.

Feb. 16-18—National Peach Conference, with Centennial Fruit Congress, Coronado Hotel, St. Louis—Carroll R. Miller, Exec. Sec'y.

Feb. 18-20—Ohio State Horticultural Society winter meeting, Hotel Cleveland, Cleveland.—C. W. Ellenwood, Sec'y.

Let VIGORO-
Feeding Increase
Your Profits!

The trend in fruit growing is toward complete feeding...supplying the trees with all of the many plant food elements they need from the soil. That's because experiments have proved that proper feeding really pays.

The big swing is to VIGORO-feeding. Thousands of fruit growers across the land have been using VIGORO for years. They know this plant food increases yields . . . improves the quality of their fruit, and fosters healthy growth. Many growers report over-the-market prices for VIGORO-grown fruit because it looks better, tastes better, and keeps better.

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It is wise to order your plant food early and take delivery early!

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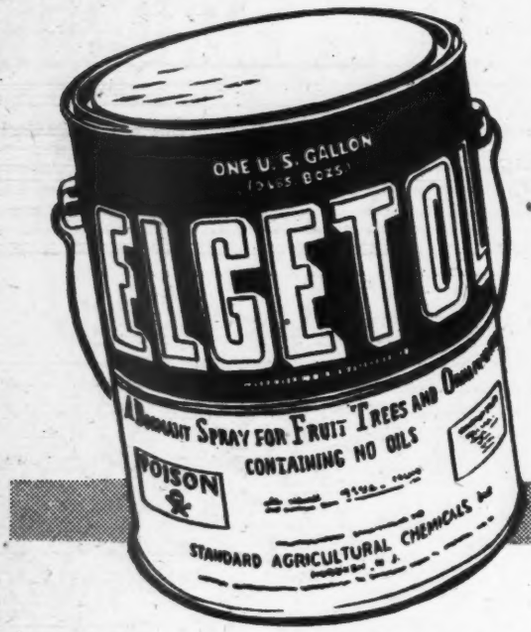

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Controls:

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This year use ELGETOL, the original water soluble dinitro dormant spray. You'll be money ahead through its triple-threat ovicidal, fungicidal and insecticidal action. You'll be money ahead, too, because highly concentrated ELGETOL gives you better control . . . more actual dinitro content in every gallon.

GROUND SPRAY IS CROP INSURANCE—Applications of ELGETOL applied for the control of APPLE SCAB should be diluted at the rate of ½ gal. per 100 gals. water and applied as a drench spray to the orchard floor at the rate of not less than 300 gals. per acre. Where cover is heavy 500 gals. of this solution is required for adequate coverage and thorough saturation.

For the control of CHERRY LEAF SPOT, orchard floor application of ELGETOL is recommended at a dilution of ¼ gal. per 100 gals. water applied for thorough saturation to orchard floor at not less than 300 gals. per acre.

Don't delay . . . see your nearest ELGETOL dealer and order your ELGETOL dormant Spray requirements now.

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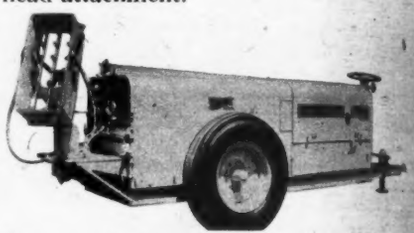
NEW

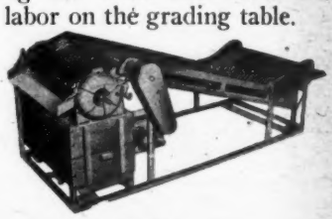
Automatic Sprayer

A new development in the automatic spraying field is the Farquhar spray head attachment which can be attached to any Farquhar IRON AGE high pressure sprayer in pump sizes ranging from 25 to 50 gallons per minute. Whereas separate machines were needed before, the same job can now be done with the spray head attachment.



Rotary Fruit Sizer

A rotary fruit sizer which eliminates all fruit too small for packing is now being introduced by Food Machinery Corp. It is a mobile unit which does a thorough job without bruising the fruit and saves much hand labor on the grading table.



"Snap-Cut" Pruner

Affording the utmost comfort in holding and operating is the Seymour Smith "Snap-Cut" pruner. Made of heat-treated airplane aluminum, it makes clean, quick healing cuts. Non-slip hand-grips, a one-finger catch, and complete replacement of parts are other new features.

Peach Pitter and Halver

The new Boutell freestone peach pitter and halver greatly broadens the peach-packing field. Vastly increased production and tremendous savings in labor permit the handling of more freestone peaches during the season at less cost according to the manufacturer.

- AUTOMATIC SPRAYER
- "SNAP-CUT" PRUNER
- ROTARY FRUIT SIZER

New Hole Digger

Manufacture of a new type, low-priced hole digger, designed to speed up hole digging by 25 percent, is announced by the Roper Mfg. Co. Practical for many uses, the digger can be installed by one man in less than five minutes; and operations can be handled from the driver's seat.

Turner Mower

What the manufacturers claim as the world's first mowing machine to be attached to the front of a four wheel vehicle is now in production at the Silver Body Plant in Knightstown, Indiana. The principal patented feature of this Turner Mower is the manner in which the "head" can be locked in any position to follow the contour of the ground.

BOOKS AND BULLETINS

- Describing the diversity of models of Shadograph scales for industrial weighing is a new bulletin, No. 3201, by the Exact Weight Scale Co.
- A complete well-illustrated catalog of Hardie sprayers with explanations of function and use of the various models and their parts and accessories has been issued by the Hardie Mfg. Co.
- A new technicolor sound movie, "Rubber Lends a Hand," is an exposition of the role rubber is playing in modern day agriculture. This film is being sponsored by the B. F. Goodrich Co.

With your chosen insecticide...

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Exhaustive tests have proved that TIFA does its work faster, with less manpower and materials.

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*APPLICATOR: *(Word now generally used to cover equipment for applying.)*

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SEYMOUR SMITH

New!! "Snap-Cut" PRUNER

THE EASIEST CUTTING PRUNER MADE

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New streamlined design entirely of rugged airplane aluminum with superhard anodized finish. Tapered, hand-fitting, non-pinching handles. Finest alloy steel, precision-ground blade, slices onto a soft-metal anvil, making a clean, quick-healing cut. "One finger" Catch, operated by the thumb or index finger, leaves the other hand free.

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There's no problem to fast handling in confined spaces if you use the Handibelt portable conveyor —save lifting—carrying; users report 8 to 10 man hours saved and volume of items handled more than doubled. Easily wheeled about by one person. Handles boxes, bags or cartons weighing up to 135 pounds. Can be used inclined, declined or horizontal. Belt is free of side rails and reversible in movement. Operates from any ordinary lighting circuit. Available in two models: No. 11 piles up to 7 ft. 6 inches; No. 16 piles up to 10 ft. 6 inches.

Get complete information—write for Handibelt Bulletin No. AFG-28

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minn.
Sales & Service in all principal cities.

Standard

AVITY & POWER CONVEYORS

SCAB CONTROL

(*Continued from page* 28)

Impartial experienced growers generally admit that net results are not based on surplus power of machinery, and microscopically-sized sulfur in degrees of split-hair variations between the manufacturers. These details are all involved, many are progressive, many are interesting. However, growers should not unthinkingly change to another brand of chemical when they fail to accomplish control, for the inadequacy may be an individual fault. There are no cure-all methods or materials, and the failure to gain control is unquestionably due to poor timing or improper coverage, if manufacturers' instructions have been followed in preparing the spray solution.

It is difficult to find original recommendations for coping with this ancient enemy. We need continued research and persistent experimentation, as we do in many other baffling unsolved problems.

We should scan the total of available information and continuously try to improve individually. What about the growers who gain control entirely by dusting? What about successful producers who are still using a modified lime-sulfur program? What should one do about reducing the height of trees for easier coverage? What varieties are most susceptible to scab, and how should these be arranged in new plantings to allow for additional spraying?

Many variations will occur in any premeditated plan for a control program. To be willing to vary when it is an obvious necessity, to use the

Swedish Fruit Display

This is the way fruit is displayed in Stockholm's largest store, the A. B. Nordiska Kompaniet.

SAVE MONEY ON YOUR MAGAZINES

Choose Your Favorite Magazines from These Lists

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AMERICAN FRUIT GROWER for One (1) Year and Your Choice of Any Two of the Following Magazines for ONLY $2.10

OR

Any Three Magazines for Only $2.50

- ☐ American Girl ..... 6 mos.
- ☐ American Poultry Journal ..... 2 yrs.
- ☐ Breeder's Gazette ..... 1 yr.
- ☐ Farm Journal & Farmer's Wife ..... 2 yrs.
- ☐ Christian Herald ..... 6 mos.
- ☐ Mother's Home Life ..... 2 yrs.
- ☐ National Live Stock Producer ..... 2 yrs.
- ☐ Open Road ..... 6 mos.
- ☐ Outdoors ..... 6 mos.
- ☐ Pathfinder (13 issues) ..... 6 mos.
- ☐ Poultry Tribune ..... 2 yrs.
- ☐ Protestant Voice ..... 6 mos.
- ☐ Photoplay ..... 6 mos.
- ☐ Parents' Magazine ..... 6 mos.
- ☐ True Romance ..... 6 mos.
- ☐ Successful Farming ..... 1 yr.

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AMERICAN FRUIT GROWER for One (1) Year and Your Choice of Any Three of the Following Magazines for ONLY $1.50

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- ☐ Everybody's Poultry Magazine ..... 1 yr.
- ☐ Farm Journal & Farmer's Wife ..... 1 yr.
- ☐ Mother's Home Life ..... 1 yr.
- ☐ National Live Stock Producer ..... 1 yr.
- ☐ Pathfinder (13 issues) ..... 6 mos.
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Enclosed find $ ..... for which please send me the magazines marked with an X.

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schedule as it is intended, subject to weather conditions, is a test of individual management and ability.

The best conscientious laborer is a good investment, usually, especially when a dusting program is involved. Nights, Sundays, and holidays have no special meaning to the scab fungus life-cycle. But when all is said and done, we surely need a new method that will remove some of the demand for vigilance and reduce the necessity for well-nigh superhuman efforts.

SOMETHING TO CROW ABOUT

(*Continued from page* 25)

the pink (on scabby varieties), or apply de-blossom sprays to avoid costly and bothersome thinning. Change and development are inevitable, but they must be selective, adaptable, and must have established themselves.

I am saying nothing about thoroughness; that is implied. I would rather stress control, which includes thoroughness. It is broader than just spray coverage. With the control of codling moth, for example, one may rightly be tempted to reduce the number of applications of costly DDT; even so, bear in mind that a second clean-up spray in first brood emergence is better than one spray for both first and second brood. Theoretically, if that first brood is cleaned up, there will be no second brood.

If we were restricted to but three sprays, what would they be? One would be the winter application of oil including DN. The next would be liquid lime sulfur in the pink, and the third would be DDT with the emergence of the first brood of codling moth. With favorable weather conditions, one might be surprised at the results. I am convinced that oil properly applied will control red mite for the following season. Last winter we applied two oil sprays to Delicious, and this was the only block with practically 100 percent results. To the oil we would certainly add DN for aphis control, and to the lime sulfur in the pink we would add about four pounds of flotation dust such as Crown or something cheap.

Spraying is nothing to get cocky about, for there are definitely such things as "the breaks." A state-wide wet spell may catch an orchardist in one area just wrong, while south of him the scab spray may have been applied beforehand, and further north buds were not yet in the pink. On the whole, however, results will be fairly consistent with the "know-how" procedure.

POLLEN PATENT GRANTED

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Box 1243, Wenatchee, Wash.

Lycopodium method of live pollen application and preservation

AIRPLANE APPLICATION 1946 Wash. State Horticultural report shows average of 57% of full crop added with Lycopodium mixture 20 volume ounces, ¼ strength pollen per acre. Other mixtures show less than zero results.

POLE DUSTER Growers report good results with pole dusters. Compressed air dusters and pole dusters now available.

BEEHIVE INSERTS New beehive inserts now accepted by many growers and beehive owners.

Ask us about bee-bait and bee-food.
BY THEIR USE DIRECT THE BEES TO THE BLOSSOMS NEEDING POLLINATION

Wand and Hand Brush Application—Slower But More Positive

Pollens available—Apples, Peaches, Pears, Cherries, Plums, Apricots, Almonds, Filberts and Walnuts

IMMEDIATE DELIVERY

This is the lowest priced, high quality Sprayer on the market.

The pump gives 4 to 6 gallons per minute at 300 to 500 lbs. pressure and is equipped with a 2¾ H.P. Briggs and Stratton engine and a 100 gallon Douglas Fir tank.

CAN BE EQUIPPED WITH SPRINGS.

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On Malling understock Red Delicious, Jonathan, McIntosh, Staymen, Winesap, Yellow Transparent, Wealthy. Write for Free Copy of our catalog and price list.
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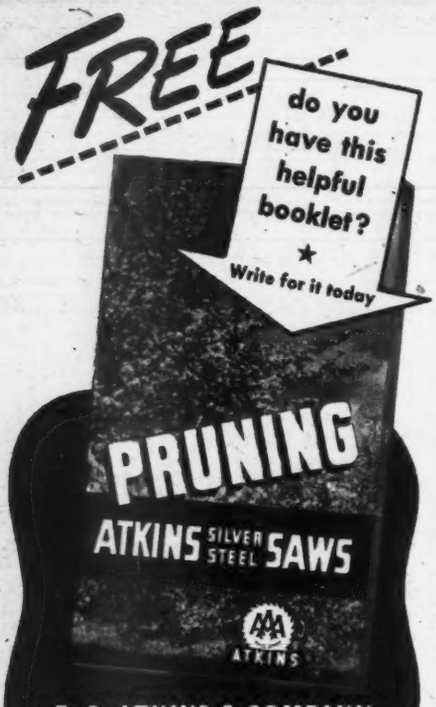
IMPROVED, GRAFTED NUT TREES
Also save your fruit, plant mulberries for birds—select Honey Locust for deer. Nut Trees, Persimmons, American & Chinese, Blueberries. List free. Descriptive bulletin 25c. Nut Tree Nurseries, Box 65C, Downingtown, Penna.



NEW BULLETINS

Many publications of the state agricultural colleges and experiment stations contain information of interest to fruit growers from other states. Frequently these bulletins may be obtained by writing the Director of Publications of the college or experiment station concerned.

- **Small Fruit Costs in Michigan** (Circ. Bul. 203, 1946) Mich. State Coll., East Lansing, gives detailed cost records for strawberries, raspberries, and blueberries.

- **Propagation of Fruit Plants** (Circ. 96, 1936, Rev. 1946) Coll, of Agr., U. of Cal., Berkeley, discusses the propagation of temperate-zone and subtropical fruits.

- **Small Fruits in the Home Garden** (Circ. 143-A, 1946) Col. A. & M. Coll., Fort Collins, tells what varieties to use, how to plant them, and how to cultivate the plants.

- **The Effect of Nitrogen Fertilization on Yield and Growth of Elberta Peach Trees** (Bul. 253, 1947) Georgia Exp. Station, Experiment, Ga., reports on one phase of studies made to determine the most practical levels at which to apply the various plant food elements.

- **Strawberry Culture and Varieties** (Bul. B-304, 1947) Okla. Agr. Exp. Station, Stillwater, summarizes information derived from tests made in Oklahoma to determine the best varieties and cultural methods for that state.

- **Freezing Foods for Home Use** (Ext. Bul. 244, 1944) U. of Minn., St. Paul, explains how to prepare and package foods for home freezing.

- **Pruning the Apple Tree** (Ext. Folder 129, 1945) U. of Minn., St. Paul, has excellent illustrations to show exactly what cuts to make in pruning an apple tree.

- **Pruning Suggestions for Apple & Pear Trees** (Circ. 315, 1947) U. of Mo. Coll. of Agr., Columbia, reviews various pruning methods and gives suggestions as to when to prune and what tools to use.

- **Orchard-Site Selection** (Ext. Bul. 697, 1946) Cornell U., Ithaca, outlines the climate and soil conditions of a good orchard site.

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GUARANTEED
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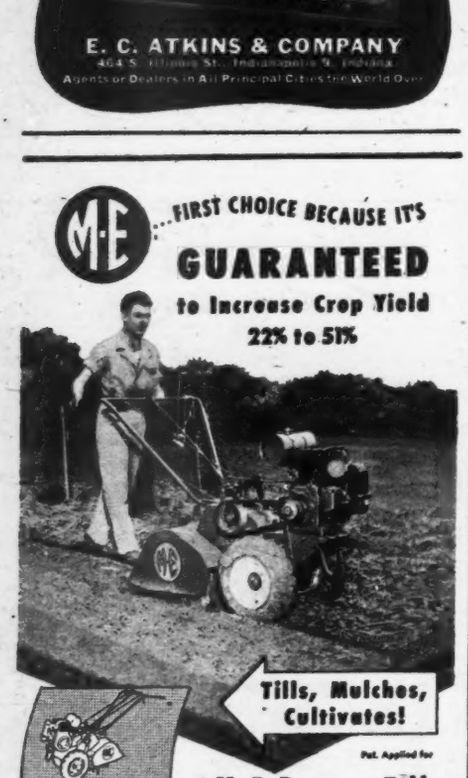
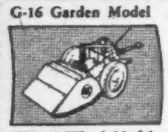
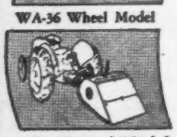
22% to 51%



G-16 Garden Model



WA-36 Wheel Model



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Does All This with LESS Work!

Prepares a perfect seed bed . . . Increases mineral and moisture content . . . Prevents erosion . . . Produces earlier disintegration . . . Eradicates quack, Johnson, and other grasses . . . *Rebuilds* soil Nature's way. M-E makes garden work easier . . . does it better . . . than any other equipment you can buy. *Write today* for illustrated folder.

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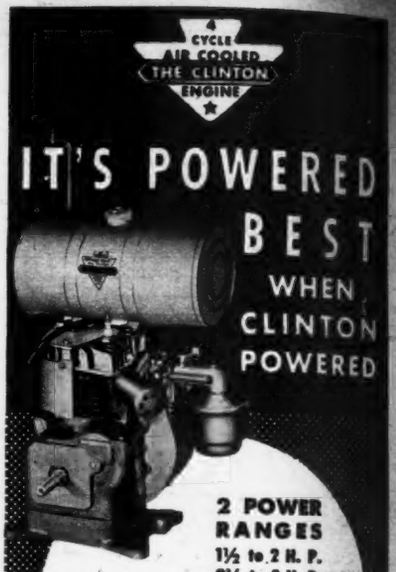

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1½ to 2 H. P.
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Clinton Engineers, specialists in Gasoline Engine Designs, have incorporated all the best features, developed by new methods in airplane engine construction into this compact air-cooled power plant of world renown. . . . That's why, wherever you go, you'll find the Clinton doing a better power job. It's sold and used in every country throughout the world.

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THERE'S ONE NEAR YOU

CLINTON MACHINE CO.
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JARI POWER SCYTHE
CUTS CLOSE TO TREES

You can mow close to fruit trees, under fences and in corners with the JARI Power Scythe. Cuts where other mowers won't. No danger of breaking low branches. 36" sickle cuts weeds, brush, grass 1½" from ground. Follows ground contour. Light weight, self-propelled, easy to handle . . . one man can cut 4-6 acres in 8 hrs.
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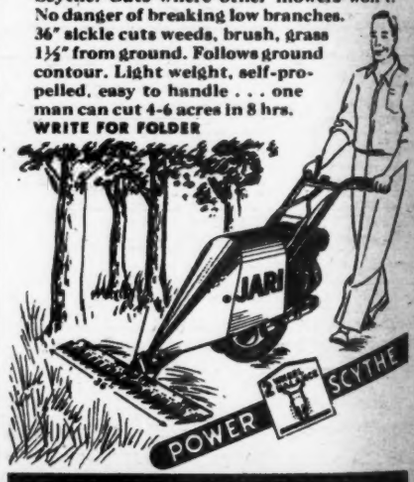

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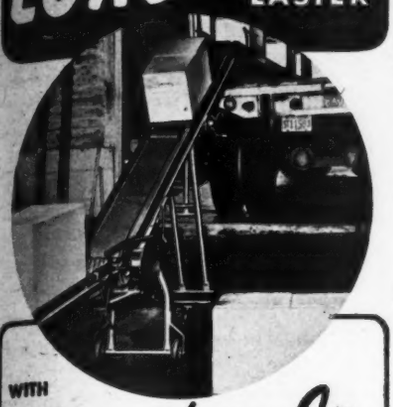

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Save time . . . manpower . . . money. Let the Stevedore, Jr. lift crates, lugs, baskets right up into your truck. It's a sturdy, portable power belt conveyor, adjustable to different receiving and delivery levels. Moves loads up or down. Plugs into nearest electrical outlet. Couple it to a Rapid-Wheel Gravity Conveyor line and you have a complete conveying system from storage or to storage. Quickly pays for itself through direct savings in time and labor. Write for details.

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SPRAYS

GET THEM ON
KEEP THEM ON
with COLLOIDAL

Z-1

This spraying season, use Colloidal Z-1 spreader and depositor with your insecticides and fungicides, for more even coverage, with heavier deposits. Be sure your protectants cover thoroughly and stay on longer, in all kinds of weather! Use Colloidal Z-1!

Ask for FREE Bulletin

COLLOIDAL PRODUCTS CORPORATION
SAN FRANCISCO 11, CALIFORNIA
SINCE 1920

TREND TO SPRAY CONCENTRATES

(*Continued from page 27*)

carried out a concentrate program for two complete seasons and reported their results before the Washington State Horticultural Society winter meeting. Using organic insecticides and miticides developed within the last five years, Marshall and Miles believe that it is possible with light, high-speed sprayers to control the most serious apple pests of British Columbia. Among four high-speed machines which they tested, one proved unsatisfactory for orchard use; one gave good results but can evidently be mechanically improved, and two gave good results after they had been somewhat modified.

Marshall and Miles conclude with this optimistic picture of what the sprayer of the future for British Columbia orchards will be like:

1. Capacity to spray an acre in 30 minutes or less and give reasonably uniform coverage.
2. Operation by one or two men, one of whom will drive the tractor. Both operators will be seated when at work.
3. Weight less than 3,000 pounds loaded so that it may be readily hauled by a light tractor.
4. Low construction and low center of gravity to give stability on sidehills and allow ready passage through densely planted orchards.
5. Mounted on four staggered airwheels or similar small pneumatic wheels or on crawler tracks to give easy riding qualities and to avoid unnecessary compaction of the orchard soil.
6. Will emit an insecticidal fog carried in a high velocity airstream probably directed at right angles to line of travel. Insecticidal fog will be produced either by steam or by hydraulic pressure.
7. Will use concentrated spray mixtures, 15 to 50 gallons per acre.

The trend to spray concentrates holds considerable promise. As is usual during a period of change, considerable confusion exists. The alert grower will keep his ear to the ground, watch the new developments closely, but as has been his custom, he will accept new operations only after they have been properly tried and tested.

NEW BOOKLET

● **"They Walk With Death"** is the title of a slide film on eradication of disease-spreading insects. It is available for free showings, and is distributed by Sherwin-Williams.

SHORT CUT TO BETTER BORDEAUX

MICHOLS

TRIANGLE BRAND

INSTANT

COPPER SULPHATE

99% + PURE!

➡ **SAVES LABOR** . . . Mixes easily in spray tank. Eliminates stock solution, minimizes handling!

➡ **SAVES TIME** . . . Dissolves rapidly. No waiting for it to go into solution!

➡ **SAVES MONEY** . . . Dissolves *thoroughly*—no waste or sediment. Gives accurate control and greater safety in your mixtures—thus giving *better protection* and *increased* yields.

● **FREE** Send postcard *today* for valuable free booklet—"Bordeaux Mixture—Its Efficient Preparation and Use."

YOUR DEALER can also supply Triangle Brand Copper Sulphate in: LARGE CRYSTALS, SMALL CRYSTALS, GRANULATED and SUPER-FINE for regular Bordeaux Mixtures; also Monohydrated for Copper-Lime dusts. *The oldest and the best known brand! Standard for over 50 years.*

A NEW ONE-MAN SAW

Post Hole Digger and Sickle-Bar Attachments Available. New improved OTTAWA Buzz Master. 2 speeds for cutting heavy brush and for road travel. Clears land of brush, saplings and large trees. Goes anywhere on its own power. Hills no obstacle. Most useful saw ever built. Pulley for belt jobs when not sawing. Reclaim waste land this easy way. Make plenty of money doing custom work. Endorsed by Conservation experts. Ottawa leads for fast and profitable sawing. Strictly a one-man machine. Woman or boy can operate. Write for FREE details.

OTTAWA MFG. CO., 2-832 Walnut, Ottawa, Kans.

TRE-TEX

TRADE MARK REG. 1947 U. S. PAT. OFFICE

SAVE EVERY TREE—Save time and money. Used at Orchardview since 1942. Orders from 42 states, Canada, Mexico. New formula stays in solution. Used like varnish, lasts year. Unused portion never spoils. Not poison. Used by big nurseries, including Stark Bros. Five uses: Rabbits and bark-eating animals. Mice. Tree-borer. Winter-kill. Adhesive, makes any dust application stick. Order now. One rabbit can kill trees in one night. Prices—Powder, 1 pound (50 to 100 trees), $1. Six pounds $5. Ten pounds $9. Prepaid. Liquid, 12 quarts, $10, express not prepaid. One agent wanted in every county. Orchardview, Noblesville, Ind.

A child can handle any amount of spray at any pressure with

HAMILTON SWIVEL GUNS

Complete line of Spray Guns, Hose & Fittings.
Write for literature

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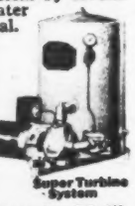
BURKS WATER SYSTEMS LAST LONGER

Every BURKS Super Turbine Water System has the Life-Lok feature. This means a BURKS System outlasts any other system by several years. Gives more water at lowest cost per gal.



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ONLY BURKS SYSTEM has LIFE-LOK Feature

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CLEAR VISION for SPRAYERS!

E-Z-C Protector with Renewable Tear-off Visor

● Use an E-Z-C shield to *protect yourself* and to get better *crop protection*—you simply tear off a strip of transparent ribbon for continuous CLEAR VISION. Low prewar price! *Send $3.50 for kit, postpaid.*

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HUNT'S GRAFTING WAXES, RODENT REPELLENT, ETC.
M. J. Beck Co., Box 7, Lansing 1, Mich.

Advertisement

From where I sit ... *by* Joe Marsh

Slim's Cows Are All Aristocrats

Slim Hines, who owns the Leafgreen Dairy, played host to government inspectors Wednesday. They inspected his barns for cleanliness, his milk for butterfat content, and his cows for health. And they ended up giving Slim a Grade-A record for fine milk!

He was boasting about it over a friendly glass of beer in Andy Botkin's Garden Tavern the other evening. Andy says: "I know just how you feel."

We knew what Andy meant. Under the Brewers' program of Self-Regulation, Andy's tavern is open day and night to inspection by agents of the industry or the law. And Andy gets a lot of satisfaction out of getting a "clean bill of health" for running a wholesome, law-abiding tavern.

From where I sit, people like Slim and Andy rate a sincere vote of thanks from their communities. They're mighty proud to have their places open to inspection at all times—they know they're running a business that's a credit to the town!

Joe Marsh

Copyright, 1948, United States Brewers Foundation

SUPERSTITIONS

(*Continued from page 26*)

dantly and be prevented from shedding its blossoms. In the case of an old and exhausted tree growing in a sandy soil, it was suggested that well-rotted manure should be applied in September directly to the roots and the soil put back again before the ice treatment was given.

In the old days many cures for premature fruit drop were in use. The most common, perhaps, was to tie around the stem a wreath of centauries, the plants having been pulled up with their roots. It was important to remember that the wreath must not be made for some days after pulling up the plants, when the flowers began to wither. Beans were also used for the same purpose. Another remedy was to tie crayfish firmly around the stem. If none of these procedures had the desired effect, the resourcefulness of the fruit grower was not exhausted. He bored a hole into the underground part of the stem and drove in a hawthorn plug. (As we see, hawthorn stood in high esteem in those days.)

If a tree was unfruitful year after year, it was clear that some evil magician had been there and bewitched it. In that case one had to clear the soil away around the stem and drive a piece of flint into the main root. In the next year the tree would bear a good crop of fruit.

Even in the old days, the fruit grower complained of insects and maggots, but he was not an idle onlooker. He fumigated under the trees or hung up some garlic in the branches. Another cure was to mix pepper, bay berry and myrrh, and to add wine to the mixture after grinding. This paste was smeared into a bore hole of the root which was plugged again with hawthorn. In this way the parasites of the crown were combated.

For good keeping, fruit must be picked at new moon, since fruit which was harvested at full moon was thought to be more susceptible to rot and spoilage.

There were even strange ideas about preserving fruit. It was said that the fruit should be cut from the tree by means of scissors, then laid into a clean, dry bottle which must be firmly sealed and kept in running water.

To be sure, many more cures and prescriptions were known among fruit growers, but the seers have taken much of this "knowledge" with them to their graves. Today our methods are not so picturesque, but they are much more practical.

DIG SEEDLING HOLES
SITTING DOWN

Every orchardist will welcome the Danuser Digger attachment for popular makes of tractors. Here is the modern way to dig holes; for seedling setting, for tree feeding, and fence posts. Augers from 4" to 18". Write for details. Dept. H.

DANUSER MACHINE CO.
FULTON, MO.

NEWEST OTTAWA LOG SAW

Self-Propelled Moves Anywhere On Own Power

World's fastest Log Saw. Powerful 6 H-P air-cooled motor. Attachments for sawing down trees, buzzing limbs, post hole digging and pulley for belt jobs. Big demand for wood, pulp, posts. Make big money sawing wood this easy way. Low factory-to-user prices. Nothing like it. FREE details.

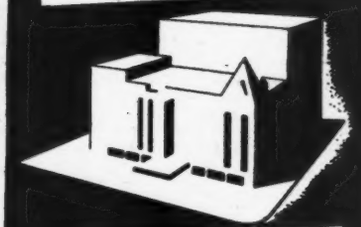
OTTAWA MFG. CO., 7-832 Pine St., Ottawa, Kansas

HAUCK FLAME GUN **KILLS WEEDS**

2000° F controlled heat quickly, easily destroys seeds, roots, brush, poison ivy, wild morning glory, Canada thistle, other unwanted growths. Many uses: splitting rocks, burning stumps, sterilizing poultry houses. Burns kerosene. Does the work of 4 men. Safe, easy to use. 10 day trial. Satisfaction guaranteed. Free catalog.

HAUCK MFG. CO.
44 Tenth St., Brooklyn 15, N.Y.

1000 ROOMS IN CLEVELAND



HOTEL HOLLENDEN

ROBERT P. JOYCE
GENERAL MANAGER

NATIONWIDE FRUITS

(*Continued from page* 31)

however, were not started until 1900 when avocados sold as high as a dollar or more a piece!

Production has never equalled that of other fruits because of the high costs. Many difficulties have been overcome, however. Production may be increased by the discovery of new, hardy, hybrid varieties which will extend the season several months. Losses because of spoilage have been decreased by flying the fruit to distant markets. However, the demand for avocados remains greater than the supply, and there are still other problems to be solved.

The orchard must have perfect soil and climatic conditions and constant protection against insects and blights. The problem of when to pick the fruit is one of several to plague the grower because the avocado has few signals to indicate harvesttime. Color, softness, and calendars are of little use—there are only slight changes in the color of the skin as maturity approaches, they do not soften on the tree, and the ripening age of one variety may change from season to season. Only the observant grower can spot the time when the fat content is at the greatest—the most desirable quality of the avocado. Very careful picking and packing of the fruit is necessary to prevent bruising.

GRAPES

● **A test vineyard** has been planted in Fredonia, New York by the New York Agricultural Experiment Station to determine if the grape yield is influenced by the spacing of the vines. The problem was raised because in Canada some rows were 12 feet apart while in the Hudson Valley rows were planted every 7 feet. Now in its third year, the vineyard will bear its first grapes this season. The yield in pounds of grapes will be recorded for each vine, and from that the yield per acre will be determined. This experiment is the first of its kind to be tried with the American type grape.

NUTS

● **New York** fruit tree specialists are trying to develop better varieties of filberts. The breeders are working for hardy trees with resistance to native filbert blight and with good, large size nuts. Almost 2,000 seedlings were raised at the New York Agricultural Experiment Station in an effort to get a nut tree as good or

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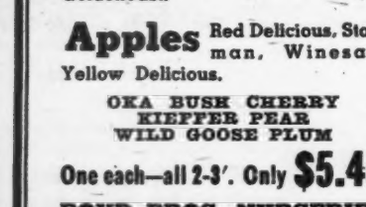

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USDA FORECASTS STEADY FRUIT DEMAND

THE 1948 DEMAND for fruit will probably continue the same as for 1947, with prices remaining near the 1947 levels, according to the latest report of the Bureau of Agricultural Economics, USDA. Demand will probably remain high because of the continued high levels of income among consumers, while the lag in production in satisfying the demand for agricultural products will help keep the prices up. Commercial export demand, however, will probably weaken during 1948 as a result of the dollar shortage among nations in the dollar sphere. In contrast, imports of bananas and canned pineapples are expected to reach, and may exceed, the pre-war figures.

In the over-all picture, fruit prices have declined steadily since 1945, but they are still above the peak of 1943. Since the termination of the war-time demand, citrus prices have fallen faster than apple prices, and because citrus production may increase faster than apple production in the near future, apple prices will probably remain slightly above their pre-war relation to citrus prices.

As for crops, another large harvest may be expected in 1948, providing that the weather is favorable. Total supplies of fruits will be large, with a possible result of surpluses for some fruits.

In general, the demand and prices for deciduous fruits of the 1947 crop are expected to hold strong, except that prices of grapes, prunes, and cranberries may be slightly lower because of a large carry-over of dried and canned fruits and wine. However, the government is assisting the dried fruit industry by making purchases this season.

Total nut production this year is about the same as that of 1946, and only pecan production is below the 1936-45 average. Almonds are expected to bring growers better prices this year, but pecan, filbert and walnut prices will probably be lower.

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FOR SALE: THE H. E. COOK FRUIT FARM, 1 MI. west of Morral, Marion County, Ohio, consisting of 132 acres of farm land, pasture, small amount of timber, and apple orchard, 6-room modern house, very nice new apple storage with cider mill and equipment to operate orchard, sprayer outfit, etc. MRS. MARY COOK, adm. Estate of Harley E. Cook, Morral, Ohio.

92.6 ACRE APPLE ORCHARD ½ MILE NORTHWEST of New Paris, Ohio. Between 3,000 and 3,500 trees. All varieties. 5 room house, not modern, large barn, underground storage, sprayer, disk, grader. Priced to sell. WRITE MRS. W. C. MYERS, 4114 N. Dixie Dr., Dayton 5, Ohio.

FOR SALE: 120 ACRES OF LAND NEAR EFFINGHAM, Illinois. 70 acres in orchard. In its prime. 20 acres which is 14 years old. Mostly Jonathans, Golden Delicious, York Imperial and Red Delicious; 30 acres pasture and work land; 20 acres of timber. Small house; New Barn and Packing Shed (plenty of water) Price $30,000 land; $5,000 equipment. If interested write DR. IRA D. ONDLER, Cogson, Iowa.

20-ACRE APPLE ORCHARD NEAR SHUBERT, NEbraska, with 36 acres producing and 32 acres new orchard 7 years old. Small improvements. Over 10,000 bushels produced last season. BYRON REED COMPANY, INC., 2nd Floor, Farnam Building, Omaha 2, Nebraska.

113 ACRE FARM—52 ACRES IN BEARING APPL orchard, good local markets, stream, good buildings. Owner retiring after 35 years of successful fruit growing. WM. S. WEAVER, Macungie, Pa.

POSITION WANTED

ORCHARD MANAGER FOR LARGE OPERATOR, company or estate. Twenty years' experience growing and marketing. Best references. Salary $10,000 per year. No less. And can earn it. ADDRESS AMERICAN FRUIT GROWER, Box 74, 1370 Ontario Street, Cleveland 13, Ohio.

POULTRY

WHITE GUINEAS—CHICKS, EGGS, STOCK. CATAlogue Free. GOSHEN POULTRY FARM, Goshen, Ind.

HELM'S PULLORUM PASSED CHICKS. HOLDER three world records. ROP Sired Matings. Sexed chicks. Free Brooding Bulletins. ILLINOIS HATCHERY, Metropolis, Illinois.

RAISE TURKEYS THE NEW WAY. WRITE FOR free information explaining how to make up to $3,000.00 in your own backyard. Address NATIONAL TURKEY INSTITUTE, Dept. 233, Columbus, Kansas.

MONEY-MAKING EXPERIMENTAL FARM POULTRY raising helps only $1.00 for 24 months. Sixty months, $2.00. Early start increases profits. Order now! POULTRY TRIBUNE, Dept. H, Mount Morris, Illinois.

SCHLICHTMAN'S U.S. APPROVED. PULLORUM CONtrolled chicks, per 100 prepaid, Leghorns, Rocks, Reds, Wyandottes, Austra Whites, $10.90. Assorted $8.95. Pedigree sired and sexed chicks. Free Catalog explaining 2-week replacement guarantee. SCHLICHTMAN HATCHERY, Appleton City, Missouri.

RABBITS

RAISE GUARANTEED CHINCHILLA RABBITS. Greatest profits from gorgeous furs, delicious meat, valuable breeders. Experience unnecessary. Fascinating hobby. Year-round, money-making business. Write world's largest breeder today. WILLOW FARM, R. 32, Sellersville, Pa.

RAINCOATS

HEAVYWEIGHT USED ARMY RAINCOATS—PRACtically new. Guaranteed perfect condition. Large, medium, small, $2.75. Pay when received. BUFORD BUTTS, Sharon, Tennessee.

RODENT CONTROL PRODUCTS

TRE-TEX FOR TREES. SEE DISPLAY AD ON PAGE 70. E. L. ECKERLEY, Box 91, NOBLESVILLE, IND.

KILL RATS AND MICE. SENCO POISON OATS FOR Mice. 10 lbs. $6.00; 25 lbs. $9.00; 50 lbs. $17.50; 100 lbs. $30.00. Senco Micro Arsenic Dust for Rats and Mice. 10 lbs. $5.00; 25 lbs. $9.00; Terms. Check with order or C.O.D. FREIGHT PREPAID. We manufacture and sell only bulk rodent poisons. No small retail packages. Write for circular. SENNEWALD DRUG CO. INC., 2723 Chouteau Avenue, St. Louis, Missouri.

TREE BANDS

YOU WILL SAVE MONEY AND SAVE YOUR APPLES If you continue to use chemically treated bands on your apple trees to control codling moth—satisfaction guaranteed. Write for prices and circulars to EDWIN H. HOUSE, Michigan Fruit Belt, Saugatuck, Michigan.

FOR BETA-NAPHTHOL TREATED APPLE TREE bands. Write M. A. KOELLER, Barry, Illinois.

VEGETABLE PLANTS FOR SALE

HORSERADISH SETS ALL LENGTHS. RALPH MAY HEW, Sioux City, Iowa.

FREE 1948 GARDEN BOOK—HAVE MORE VEGEtables earlier by setting Piedmont field-grown Cabbage, Onion, Lettuce, Broccoli, Cauliflower, Beet, Tomato, Potato, Eggplant, Pepper Plants. Same low prices. Safe Delivery Guaranteed. Write today. PIEDMONT PLANT COMPANY, Box 917, Albany, Georgia.

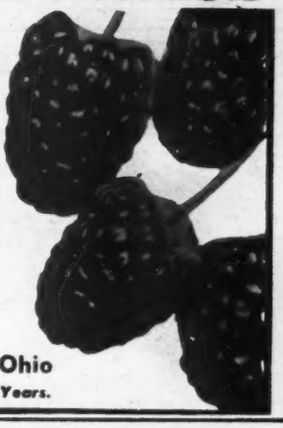
WANTED TO BUY

WANTED: GOOD USED SPRAY OUTFIT. 12 TO 18 gallons per minute, 8 to 10 H.P. engine. Address ALBERT MARSHALL, Seville, Ohio.

SPRAYER SUITABLE FOR SMALL ORCHARD. MUST be in good working order. JACOB SCHLABACH, Route 4, Millersburg, Ohio.

SCARFF'S Berry Plants

Best for Commercial — Finest for Home Planting



REGISTERED BLACK RASPBERRIES
NEW LOGAN — most profitable, early, heavy yielding, disease resistant.
BRISTOL — best all around mid-season variety.

RED RASPBERRIES — heavy fruiting LATHAM and NEWBURG varieties.

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Boysenberries, Currants, Gooseberries, Grapes, Strawberries, Fruit Trees, Dwarf Fruits, Hardy Nuts, Ornamental Fruits, etc. Write today for Complete Catalog and Cultural Guide.

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Why continue to suffer with an uncomfortable truss if we can help you? Relief GUARANTEED or it costs you nothing. Send for the facts about my perfected truss invention—the Brooks Appliance for reducible rupture—with the patented AIR-CUSHION support that works silently with Nature to give protection. Thousands bought by doctors.

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VEGETABLE PLANTS

Best Varieties—Order Today

CABBAGE - 2000 FOR $3.50
ONIONS - 6000 FOR $4.85

W. G. FARRIER PLANT CO.
Box 110 Omaha, Texas

NEW! Orchard Saw

FAMED BEAVER—40" fast-cutting saw. ONE MAN ALONE can saw down, cut up trees. Saves time. Earns you money. Folds like jackknife—easily carried. A boy can operate it. Low price—pays out fast. Write for facts. Order for quick delivery. FOLDING SAWING MACHINE WKS., Dept. G-2744 West 37th Place, Chicago 32, Illinois.

- PRUNING TOOLS
- GRAFTING SUPPLIES
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. . a good, profitable side line . . a fascinating interesting hobby. Easy, requires little time, and you can produce all the delicious honey your family can use. U.S.D.A. recognizes bees as the most important pollinating agent for 60 farm crops.

Send $1.00 for book "First Lessons in Beekeeping" (new Edition) and 6 months subscription to leading bee magazine.

AMERICAN BEE JOURNAL, Box G3, Hamilton, Ill.

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No experience needed. Start with pure-bred CHIN-CHIN Chinchilla rabbits—a few females and a male—you'll soon have at small cost, a large, profitable herd. FREE INSTRUCTIONS. BIG DEMAND for breeding and laboratory stock, meat, and world's most beautiful rabbit fur. DEALERS, CUT OFF FROM IMPORTED RABBIT PELTS BY WORLD FAMINE, NEED CHIN-CHIN FURS NOW AND FOR YEARS TO COME! Write today for free, illustrated catalog.

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KINKADE GARDEN TRACTOR

and Power Lawnmower

A Practical Power Plow and Cultivator for Gardeners, Suburbanites, Florists, Truckers, Nurserymen, Fruit Growers.

Catalog Free

Easy Terms - Write Today
American Farm Machine Co.
1105 33rd Av. SE. Minneapolis, Minn.

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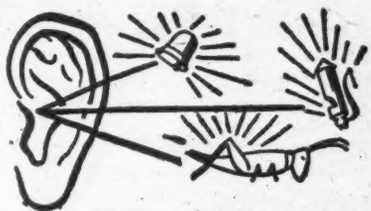


If you suffer from those miserable ear noises and are Hard of Hearing due to catarrh of the head, write us NOW for proof of the good results our simple home treatment has accomplished for a great many people. NOTHING TO WEAR. Many past 70 report ear noises gone and hearing fine. ***Send NOW for proof and 30 days trial offer.***

THE ELMO CO. Dept. 1046, Davenport, Iowa

Dwarf Korean CHERRIES

EASY TO PICK . . .
bushes only knee high!

This hardy, ornamental bush cherry bears loads of delicious, full-sized cherries the *second* year. Fruit is a little sweeter than regular cherries. Makes excellent pies, sauce and jelly.

Easy to pick! They grow only 3 to 3½ feet tall—you can pick them without a ladder.

WRITE for 1948 Catalog!
ANDREWS NURSERY
107 ORCHARD CREST • FARIBAULT, MINN.

OTTAWA TRACTOR SAW

Costs Too Little To Be Without

350 Cuts Per Minute

Make money sawing wood. Use Ottawa--fastest cutting. Cuts large, small logs easiest way. Fells trees. One man operates. Thousands in use. Built to last with heavy, stiff saw blade. Positive safety clutch control; uses power take-off any tractor. OTTAWA MFG. CO., 3-832, Forest Ave., Ottawa, Kans.

KILL RATS WEEDS INSECTS HEAT

Using 6% Kerosene, 94% Air, this torch burns weeds, roots, stalks, splits rocks, irrigates, thaws, heats iron, disinfects. KILLS OVER 100 FARM USES. Write for full description and prices.

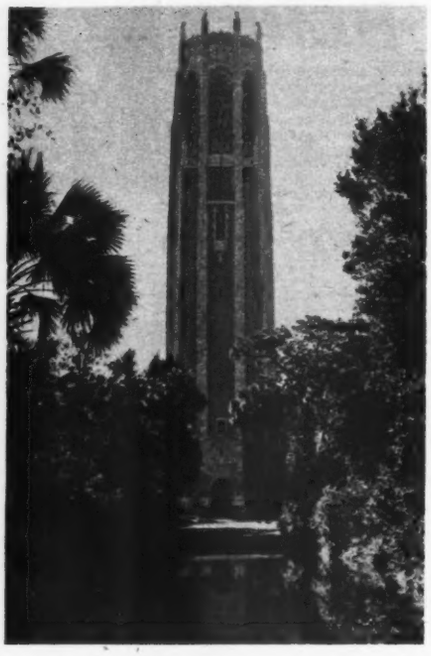
SINE EQUIPMENT
AF3 QUAKERTOWN, PA.

Ramblings OF A HORTICULTURIST

Florida

IT WAS A BRIGHT, warm Sunday morning in January when I first entered Florida. Indeed it was a pleasure to be riding along with windows down and sleeves rolled up. But I carried along a humble thought of my northern friends suffering in the frigid grasp of winter. The deeper I penetrated the Florida peninsula that day the more intense became the sun's rays and the more comforting and soothing the friendly climate.

There is much of interest to be seen on this great southeastern thumb of the North American continent. I, like some of you, had read much about it, but this was to be my first real experience in this land that "floweth with milk and honey" —and citrus.



The story of Florida's agricultural development is both fascinating and intriguing—fascinating because of the enormous amount of work that has gone into the making of productive soil from land that before was practically worthless; intriguing because of man's cunning and strategy used to promote the gigantic conversion. And the land evolution is not yet at an end, for huge chunks of the swamps are still being drained and put under cultivation for the first time in history. Powerful bulldozers can be seen pushing the pine trees from the coral rock of southern Florida, making way for the planting of lime and avocado groves. So man's conquest of virgin land proceeds.

The visitor's first impression of the Florida citrus industry is its enormous size. The central Florida area surrounding the cities of Winter Haven, Lake Wales and Lakeland is almost a solid mass of citrus groves. They dot every sandy hill and surround every lake in picturesque fashion. Highways are crowded with the heavy traffic of huge trucks hauling fruit from grove to packing house and to juice plants. Down row after row of trees the many miles of irrigation pipe spurt water as high as the treetops and give drink to thirsty roots deep in the sandy soil. Here and there picking crews can be spotted as they busily snip off the fruit that will soon grace some northerner's table in one form or another.

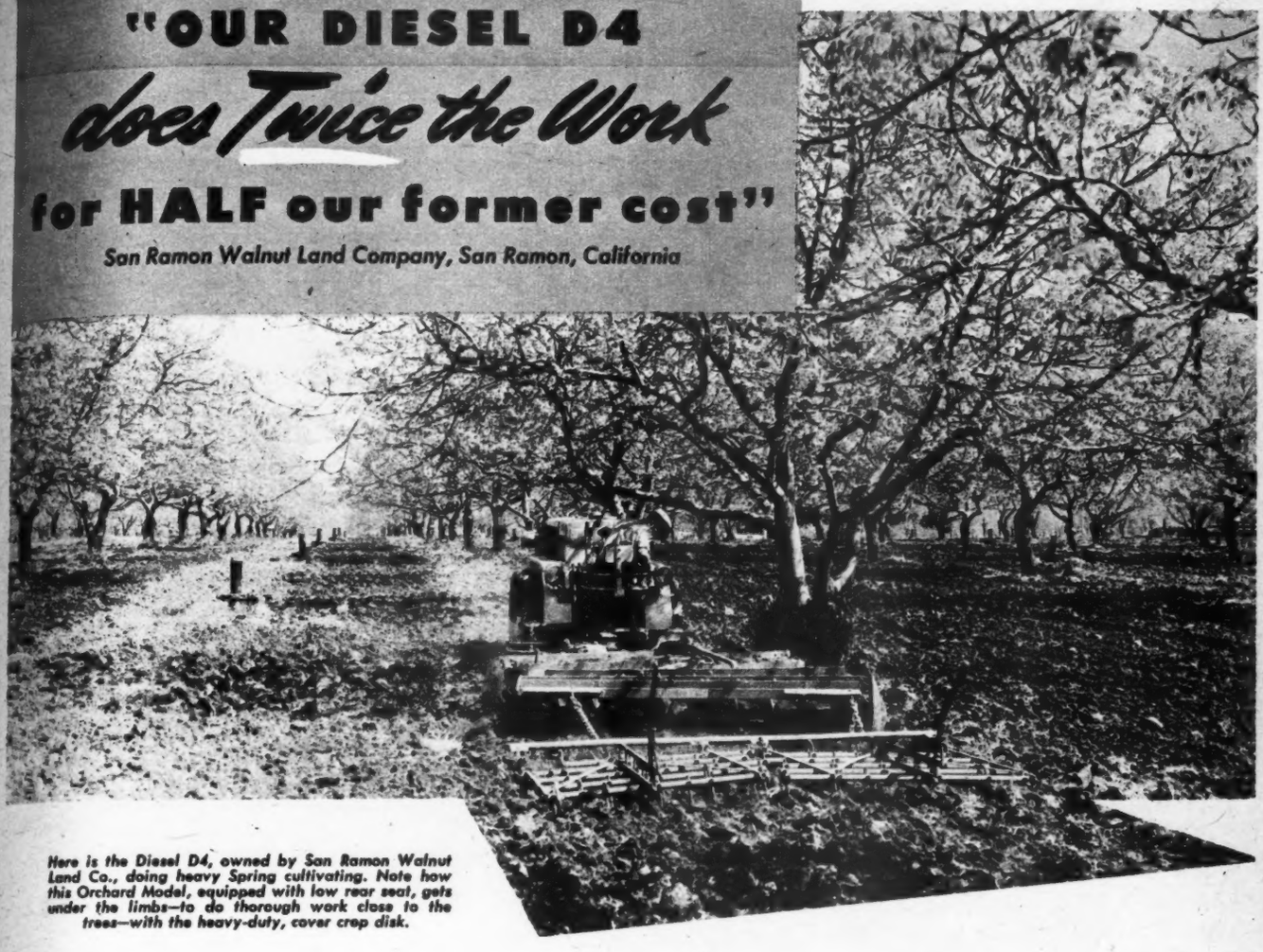
There is one especially beautiful spot near Lake Wales—the Mountain Lake Sanctuary and Singing Tower. The Tower is a humble gift to America from the distinguished Edward W. Bok. The Sanctuary is surrounded by masses of citrus groves and at noon when the carillonneur tickles the bells, they respond in joyful and beautiful tunes that mingle with the hum of sprayers and the drone of tractors gliding down through the surrounding groves. I should think fruit from these groves would have an exceptionally pleasant flavor.

The magnitude of the Florida citrus industry can be grasped only by a thorough study of its well-organized structure. I spent more than a week peering into the rigging of this leviathan of southern horticulture, and came away knowing that there remains infinitely more to be learned than was grasped in the short time spent.

A striking characteristic was the method of grove operation. In fact there really are three or four methods. A grower may own his own grove and operate it much the same way that a Michigan apple grower will operate his orchard, with his own equipment and packing plant. To do this, however, he must be a very large grower, usually having several hundred acres. Another system is one in which the land owner signs a contract with a large commercial packing house to grow, pack and market his crop. Or, he may grow his own crop and sell it to the packing house at harvest. Still another method, and perhaps the most important one, is under a system of cooperatively owned packing houses. Under this method the growers are organized into cooperative packing house associations which completely handle the grove and packing. This method releases the grower from almost all responsibilities in growing and packing his citrus crop. His packing house association, of which he is a part, takes complete charge of the grove, packs the fruit and handles the marketing. Such a cooperative will operate several thousand acres of groves.—*E.B.*

"OUR DIESEL D4 *does Twice the Work* for HALF our former cost"

San Ramon Walnut Land Company, San Ramon, California



Here is the Diesel D4, owned by San Ramon Walnut Land Co., doing heavy Spring cultivating. Note how this Orchard Model, equipped with low rear seat, gets under the limbs—to do thorough work close to the trees—with the heavy-duty, cover crop disk.

HELP SHORTAGE and mounting expense put special emphasis on the "Caterpillar" Diesel Tractor's ability to tend more orchard in the hours available—and to operate for considerably less than a smaller spark-ignition unit replaced. The results reported by this grower are typical!

"Our Diesel D4's hour meter shows that we have done 1,090 hours of work since we bought this tractor a year ago," states Burton G. Brant, Foreman, San Ramon Walnut Land Company, San Ramon, California. "In that time we have used 1,635 gallons of Diesel fuel (an average of only 1½ gallons per hour).

"Our record books show that while delivering twice the horsepower of our smaller gasoline-powered tractor, our D4 has cost us only half as much to operate. That, we feel, is real economy."

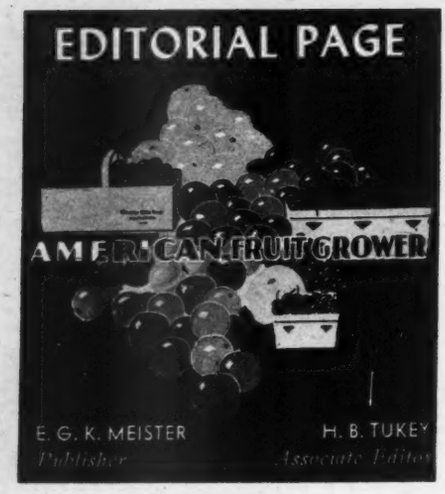
Fruit-growers have proved through the years that "Caterpillar" Diesel Tractors, with the sure traction and ample power for every orchard job and condition, are built to turn their large savings into operating profits. Several of these Diesels, for example, that have each worked over 20,000 hours for Western growers, (equal to 20 years or more in the average Eastern orchard) are still going strong.

CATERPILLAR TRACTOR CO., PEORIA, ILL.

CATERPILLAR DIESEL

REG. U. S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



Safety First

Last year Congress passed a Federal Insecticide, Fungicide and Rodenticide Act to protect users of economic poisons. The law provides registration of all such materials with the U. S. Department of Agriculture. It also provides a system of labeling which should make the use of these materials safe and effective.

The safety factor cannot be overemphasized. However, there is no need to be unduly alarmed by the many warnings which appear on the labels of some of the newer materials. When a chemical is injurious to the skin or dangerous when inhaled either as a vapor or a dust, suitable precautions must be taken. The use of respirators, face shields, rubber and other protective clothing is just good common sense. Plainly marking all containers in which materials are stored with the date of purchase and the name of the poison is another safety measure. Containers should be tightly closed and stored under lock and key where children or animals cannot reach them. Unused, discarded materials and empty packages should either be burned in the open air or buried.

The label of a reputable manufacturer and careful observance of directions thereon is the best guarantee of performance, satisfaction and safety for fruit growers. It cannot be stressed too strongly—follow directions on the label.

The Commercial Exhibits

THE FEATURE of the annual meetings of the various state horticultural societies is the interesting and instructive exhibits of new machinery, equipment, and supplies. Growers like to browse among the exhibits, talk with their suppliers, and make plans for saving time, labor, and worry with something new and efficient.

There is, however, much room for improvement in handling the commercial exhibits. Only a few societies have adequate and satisfactory exhibit space. And this despite the fact that many receive considerable revenue from the various commercial exhibits in both the sale of booth space and advertising in a convention program which goes a long way toward defraying the expense of each annual meeting. Also, many societies select dates for annual meetings which conflict with other meetings. This makes it impossible for industrial companies to send qualified representatives and satisfactory exhibits.

Because of the many new things which will be ready for fruit growers, the commercial exhibits are bound to grow more interesting and profitable. Arrangements should, therefore, be made to organize these exhibits on a national basis so that they will become available to all the societies who have facilities to house them. The first step in such an arrangement is to schedule meetings to avoid conflicting dates and excessive expenditure of time and money in moving machinery and equipment from one meeting to another.

An organization composed of a representative of each society and the principal exhibitors could easily put the entire matter on a business basis. AMERICAN FRUIT GROWER recommends the formation of a horticultural show group for this purpose. It will result in a more profitable and more complete service for all growers and better cooperation between exhibitors and societies.

Fruit Production at a Glance

	1936-45	1946	1947
Apples bushels	112,896,000	119,410,000	112,503,000
Peaches bushels	62,936,000	86,643,000	82,981,000
Pears bushels	29,510,000	34,447,000	35,350,000
Grapes tons	2,578,920	3,119,500	3,093,800
Plums and Prunes tons (fresh)	707,660	791,000	672,300
Cherries tons	159,157	229,620	180,830

CITRUS

	1936-45	1946-47	Jan. 1, Est. 1947-48
Oranges boxes	83,488,000	113,980,000	108,260,000
Grapefruit boxes	44,593,000	59,640,000	62,270,000

Spray Ring Idea Expands

THE USE of the power sprayer continues to grow, and while its service a short time ago was confined largely to orchard work, it has a definite application today in farming of all kinds. Many farmers and some growers have not been able to adopt newer methods of weed, insect and disease control because application equipment was not available, such equipment was too expensive, or the work interfered with other farm work.

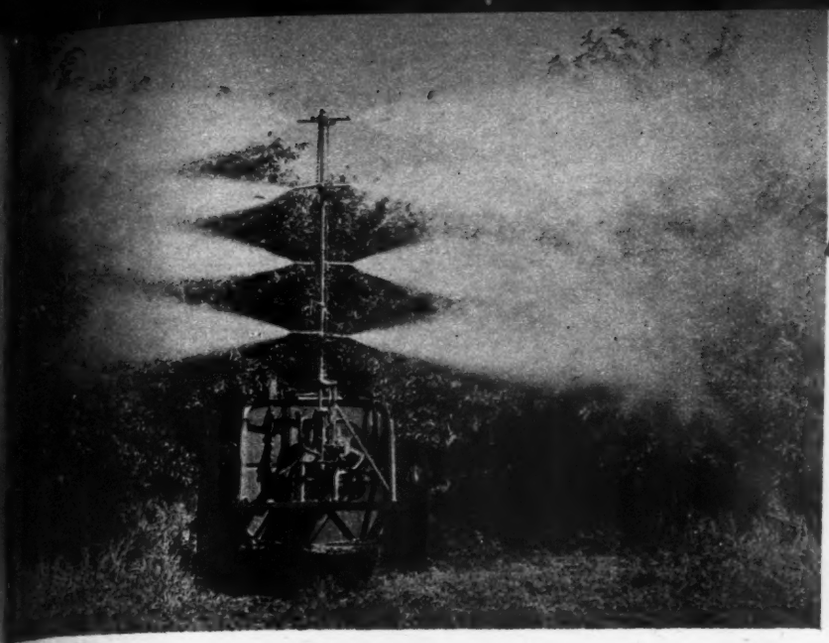
In many cases, jobs which require expensive equipment come at spasmodic and irregular intervals, yet must be done quickly and at low cost, if at all. Possibly, if the grower had to purchase the equipment himself, the investment would not pay. However, by means of cooperation such as the spray ring, equipment can be made available to the grower at minimum cost to himself.

The spray ring idea makes available to a group of growers the best equipment for the job, irrespective of cost, and a service which relieves the grower entirely of any financial or physical strain. This proves to be one of the greatest advantages of the system.

Weed control by spraying is in its infancy but is bound to become big business in agriculture. The chemicals for weed control are ready. The method of applying them presents no particular problem.

The fruit grower would do well to look into the possibility of becoming a contract sprayer by organizing spray rings and taking over the responsibility as operator. He is best-fitted by experience with chemicals and their application to do this successfully. The idea is not new and is being carried out in many fruit growing areas. Furthermore, the number of spray rings successfully launched and operating the past year is already up in the thousands and is rapidly reaching the calibre of big business.

The principle is basically sound and puts at the disposal of growers and farmers equipment they could not afford to own or maintain but the service of which is indispensable to economical and labor saving operation. The spray ring idea is expanding and includes such equipment as brush hogs, power augers for digging post holes and planting nursery trees, power chain saws, bulldozers for taking out old trees and making ponds, and trenchers for digging drainage ditches.



Here's an action photo of the new John Bean Eight-Gun Automatic Spray Mast! Here's the proof of performance. Note the spray pattern and the drive from the John Bean GUNS. Power for the automatic operation is by direct drive from the agitator shaft. Here's the kind of one-man automatic high-pressure spraying that you've always wanted.

John Bean Sprayers fit the orchard! Use the new four-gun Spray Mast in either a vertical or horizontal position. If branches are in the way, switch the Mast to the horizontal position and keep on spraying. The manually operated four-gun Mast is designed for one-hand control and is simple and easy to use.

John BEAN SPRAYERS FIT THE ORCHARD

JOHN BEAN AUTOMATIC SPRAYING SPEEDS WORK— CUTS LABOR COSTS

You get thorough coverage *fast* and save on labor at the same time with either a John Bean Royal sprayer and Spray Mast or a *Speed Sprayer*.

See the new John Bean Automatic Spray Masts. Attach either the four-gun or eight-gun model to your Bean Royal sprayer and cut your operating costs with automatic spraying. John Bean Spray Masts are simple, rugged, and built for performance. Spray material feeds directly from tough spring-steel mast to high-pressure guns. Guns connect to mast with patented leak-proof swivel. Direct drive from agitator shaft supplies power for automatic operation. Four-gun Mast sprays on either side and eight-gun Mast sprays on both sides.

Hand-operated John Bean Spray Masts save labor and expense. Four-gun model operates in either vertical or horizontal position. Seven-gun model attaches to rear of sprayer and is operated by remote controls.

THE MAST WITH THE GUNS

ALL John Bean Spray Masts have high-pressure GUNS. They have the drive to penetrate dense foliage and put the protection into the tops because Spray Mast Guns are patterned after the famous John Bean Spraymaster gun. Again, you get PERFORMANCE when you own a BEAN.

JOHN BEAN

DIVISION OF FOOD MACHINERY CORPORATION

LANSING, 4 fmc MICHIGAN

"OUR PEAK RATE OF APPLICATION HAS BEEN 5,000 GALLONS PER HOUR!" writes W. A. Schaefer of the Schaefer Orchards, Sparta, Mich. in telling about the operation of his *Speed Sprayer*. "We have been using two *Speed Sprayers* in about 300 acres of orchard. The big advantage of *Speed Sprayer* is in timing of application so it can be done very quickly and thoroughly, and at the same time cutting operating costs 50%," Mr. Schaefer adds. The 5,000 gallon per hour application was obtained using both Speed Sprayers and refill units.

"HAVE YOU PLANNED YOUR DORMANT PROGRAM?"

Fruit growers everywhere know that cleaner fruit brings better sales. They start early with a dormant spraying program to control insects that "winter over." To get a head start on the spraying that will help bring larger profits at harvest time, use Dow's tested fungicides and insecticides. Each Dow product is uniform and dependable—tested and proved thoroughly—designed to fill a specific need. Plan now for cleaner fruit—plan to use Dow products for best results!

CLEAN FRUIT SELLS

Newest dormant insecticide and fungicide is DN-289—a liquid Dinitro material tested since 1942. DN-289, a stable, brown solution readily miscible with water, has been effective against a variety of insects such as . . . Rosy Apple Aphid, Grain Aphid, Early Summer Green Aphid, Currant Aphid, Black Cherry Aphid, Mealy Plum Aphid, Viburnum Aphid, Eye-spotted Bud Moth, Cherry Case-bearer, and Pear Psylla. DN-289 shows much promise against scales and European Red Mite. As a fungicide it has been effective on sooty fungus on pears.

DN-289 should *not* be used with oil. It should *not* be used on peaches. See your county agent or qualified supplier.

Also available, Dowspray Dormant, an effective DN oil product, and DN-Dry Mix No. 2, a dry product for use in water—or in combination with emulsifiable or miscible oil.

New: DN-289!

also available

Dowspray Dormant or DN-Dry Mix No. 2

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New York • Boston • Philadelphia • Washington • Cleveland • Detroit
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